

# COMPUTERWORLD

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## Inside

L SECTION  
DEX/FALL '83,  
OPENS TODAY

IN LAS VEGAS, BEGINS  
ON PAGE 13.

A robot that replaced four workers is the focus of a possibly precedent-setting complaint filed by a Pittsburgh union. Page 4.

Just weeks after it ducked out of the home computer market, Texas Instruments, Inc. leaped into another hot market area by introducing a suitcase-size computer for business professionals. Page 7.

Information systems managers will face increasing pressures as micro-to-mainframe links allow more people to compete for host system time, a senior IBM manager warned at last week's Enterprise Information Systems Forum. Page 10.

"When in doubt, buy it out" seems to be the battle cry of software and services firms this year. Page 135.

## Congressional Action Desultory No DP Crime Law Again This Year

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Supporters of federal computer crime legislation have seen yet another year pass without congressional action on bills to make misuse and abuse of computers a federal crime.

When Congress adjourned for the year Nov. 18, the growing number of federal bills on this subject had received no more than initial consideration. A last-day hearing on the bills in a House of Representatives judiciary subcommittee was held as little more than a favor to the bills' sponsors, who pressed the subcommittee for action, but they were not given much reason to hope that the legislation would move

any faster next year.

Rep. Don Edwards (D-Calif.), chairman of the Judiciary Subcommittee on Civil and Constitutional Rights, which has jurisdiction over the bills, told the hearing that "the subcommittee will move ahead promptly" to determine if there is a need for a federal law on computer crime.

Rep. Bill Nelson (D-Fla.), sponsor of the Federal Computer Systems Protection Act, reminded Edwards that he, Nelson, has been prodding the subcommittee for four years. Nelson said that even if every state passes its own computer crime law, there will still be a need for a law covering abuse of federal computers and computer systems in interstate commerce.

"You are quite legitimately concerned if there is a national mandate for this legislation," Nelson told Edwards. But pointing to a growing concern in Congress about computer security and crime — a concern prompted in no small part by the recent spate of arrests of youthful computer hackers caught illegally accessing computer systems — Nelson also said "that mandate is quite clearly now being spoken."

Although the current bills have moved no further than did the first computer crime bill, introduced more than six years ago, there is much more support for such legislation now on Capitol Hill. That support is shown in the number of different but related bills

(Continued on Page 8)

## Part of VAX Shipment Surfaces in Sweden

By Peter Bartolik

And John Gallant

CW Staff

Part of an illegally shipped dual-processor Digital Equipment Corp. superminicomputer that had been reported seized in West Germany on Nov. 11 showed up a week ago in Sweden, just one stop away from its alleged destination in the Soviet Union.

The U.S. Customs Service revealed on Nov. 20 that part of the VAX-11/782 consignment reported seized in Hamburg, West Germany [CW, Nov. 21], had been shipped to Sweden aboard the Swedish vessel Elgaren, the same freighter that had carried it to Hamburg.

It was not known at press time how the second part of the consignment slipped by the West Germans or what exactly is in four closed containers currently under armed guard in the Swedish free port of Helsingborg.

Christine Frazer, a spokeswoman for U.S. Customs, said the three containers seized earlier this month in West Germany contained the VAX-11/782 along with generators, air conditioning units and other related equipment. But spokesmen for the U.S. State Department said the four containers in Sweden are "thought to be the VAX-11/782 Model 1 . . . [and] it is believed that the equipment is part of a shipment that passed through South Africa, part of which was confiscated in West Germany."

Customs' Frazer said the West Germans are conducting a complete inventory

and investigation.

DEC spokesman Joseph Nahill said it was his understanding that only one dual-processor VAX-11/782 system was involved in the case. The company is cooperating with the Customs investigation and would not provide details on the New York company that allegedly shipped the equipment through an affiliated company in South Africa.

The South African company, according to press reports there and in the UK, is controlled by Richard Mueller, reported by British and South African press to be an agent of the Soviet KGB. Mueller has been named in

two illegal export cases that occurred in the U.S. in the late 1970s. The first involved exporting equipment to establish a microcomputer assembly line [CW, Feb. 9, 1981]; the second concerned an attempt to ship a computerized drafting system to the Soviet Union [CW, Sept. 14, 1981].

Because of his alleged involvement in those cases, Mueller — a fugitive from a U.S. indictment — has been barred from U.S. trade for 20 years.

According to South African reports, Mueller relocated there in 1980 and purchased a vineyard for a

(Continued on Page 4)

### ILLEGAL EXPORTS



Wide World Photo

## Roadblock

Striking workers scuffled with police last week in front of Boston's Greyhound terminal in an effort to keep the buses from rolling. Programmers and data entry staff in Greyhound's DP shop either walked off the job or were drafted into non-computer-related services. Story on Page 5.

## SPECIAL REPORT

Inside —  
Protecting the Corporate Data Resource





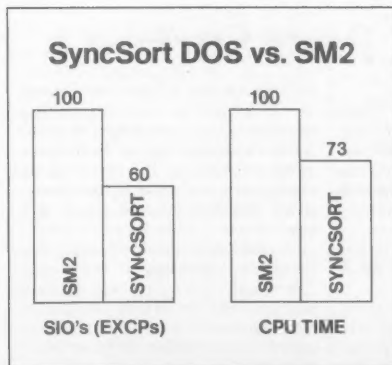


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# Union Files Complaint Objecting to Robot

By Patricia Keefe  
CW Staff

PITTSBURGH, Pa. — A potential precedent-setting case concerning the rights of workers replaced by robots has been filed with the Federal Labor Relations Authority (FLRA) in New York.

The complaint, filed by Richard Clougherty, president of Local 644 of the American Federation of Government employees here, charges the U.S. Labor Department with failing to inform the union that a robot would be installed. It seeks to secure the employment rights of four workers who lost their jobs to the robot.

If a ruling is handed down in favor of the government employees involved, it could have a far-reaching impact on federal and private-sector organizations seeking to take advantage of robotics, according to Clougherty. He said organizations that install robotics will have to address rather than just consider the human side of automation.

Clougherty filed the complaint of unfair labor practices with the FLRA on Nov. 1, after learning a robot had been used at the Labor Department's Mine Safety and Health Administration (MSHA) since July to test dust samples from mines, replacing four nonunion MSHA laboratory employees. A union official discovered its presence accidentally while investigating another grievance.

Although the four workers do not belong to the union, federal law re-

quires the union to represent all workers at the facility, Clougherty explained. The four workers have been assigned to other jobs, but Clougherty is concerned about their future employment. "Basically, they're doing busywork, and every day they get closer to running out of busywork to do and closer to the street."

Clougherty conceded the robot "is probably here to stay" and described the job it does as "dirty and terrible." However, the union is "fussed up" about what will happen to the four

unskilled workers, not whether the robot can do the job better, he said.

Because of the publicity surrounding the case, Clougherty expects there will be pressure on the FLRA to resolve the dispute quickly. An investigator will start the process Dec. 5, when he visits here to interview the parties involved.

Clougherty claimed the case is an embarrassment to the Labor Department and said he expects it will deny the charge and force the case to go to a hearing. The union local president is convinced the case is a "sure win-

ner." He said the union will ask that the robot be "retired" and the workers given back their jobs until MSHA and union officials can reach an agreement concerning the workers' future. Options include job retraining and transferring the workers to another government facility.

If the union does win, it could set a precedent for future robot/worker cases, Clougherty predicted. As for the FLRA, although it has settled cases on automation via the bargaining process, it has never before dealt with a case involving a robot.

## Firm Indirectly Owned by China

# Chipex Fined for Illegal Wafer Exports

By Peter Bartolik  
CW Staff

SAN JOSE, Calif. — An electronics company based here and partially owned indirectly by the Peoples Republic of China recently pleaded guilty to exporting silicon wafers illegally and received the maximum \$50,000 fine.

Chipex, Inc. pleaded guilty on Nov. 17 to shipping without export license the silicon materials that are generally used to manufacture integrated cir-

cuits. The shipments were made in May 1981.

The guilty plea came in response to a "criminal information" filing made by the U.S. Attorney's office. According to Assistant U.S. Attorney Eric Fisher, that kind of filing is a procedure that can be used in all cases involving misdemeanors and in felony cases where the accused waives the indictment procedure.

The U.S. government charged in the filing that Chipex was "just a front ... to train Chinese engineers in the actual process" of manufacturing semiconductors, Fisher said. However, he indicated there was no sign that the company was acting as an intelligence agent for the communist Chinese government.

Chipex, according to Fisher, is owned by the Hong Kong firm of Hua Ko Electronic Co. Hua Ko is a joint venture of Teleart Ltd. of Hong Kong and Hua Yuan Import Export Co., the Hong Kong trading arm of Peking's China National Light Industries Corp.

Chipex had been under investigation by the U.S. Department of Commerce for two years prior to the filing in San Francisco U.S. District Court, Fisher said. On May 1 of last year, U.S. Customs agents seized a

Chipex shipment of 75 silicon wafers that were about to be shipped from San Francisco's airport without an export license. The Justice Department also executed a search warrant against Chipex in July of last year.

"What [Chipex] actually set up was a wafer fabrication plant [in San Jose] and they purchased enough semiconductor manufacturing equipment to actually manufacture semiconductors," Fisher said, adding, "They obtained designs from various U.S. companies. What we alleged is that that was just a front; what they really were there to do was to train Chinese engineers in the actual process."

In a related case, two California firms hired as consultants by Chipex both pleaded guilty in September to the illegal export of technical data. United Pacific Enterprise, Inc. of Cupertino and HSCMOS, Inc. of Fremont were each fined \$5,000 after criminal informations were filed in both cases.

As a result of the plea agreement, only the company was charged, and none of its executives face charges, according to Fisher. He said the company also faces civil and administrative penalties to be administered by the Commerce Department.



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## More VAX Parts Surface

(Continued from Page 1)

reported sum of \$2 million. South Africa's commissioner of police, Gen. Johann Coetzee, reportedly has said that Mueller is hiding in Austria and that South Africa is cooperating with two U.S. agents in a "top-level probe."

Mueller's wife, according to the reports, remains in Capetown, South Africa.

The U.S. Commerce Department, which reportedly issued an export license for the VAX system, would not comment on the New York firm that purchased and shipped the equipment or its alleged connection with Mueller. "Information on the name of the company granted the export license is not available for two quite compelling reasons," a Customs spokesman said. "One, the regulations ... under which we grant these licenses require that we keep all information in them confidential. Second, we cannot comment on that because this particular case is under investigation."

A spokesman for the State Department, which is negotiating with Swedish officials over the fate of the VAX equipment seized in Sweden, could not identify the owner of the equipment, nor could he confirm or deny Mueller's alleged status as a spy.

A spokesman for the Swedish Embassy in Washington, D.C., said, "The authorities in Sweden have said they will do all they can to keep the equipment in Sweden; the coast guard and the police are guarding it at present. We are currently working on a solution with the buyer and the U.S. The status of the equipment is being investigated currently, and the contents of the shipment will be determined through that investigation."

Last Tuesday, the Swedish government announced it had invoked a regulation prohibiting the import of war material from South Africa, and the embassy spokesman added that no one had as yet claimed the shipment sitting in Helsingborg.

# At Both Greyhound and Its Rival DP Departments Feeling Impact of Bus Strike

By Jim Bartimo  
CW Staff

PHOENIX — The three-week-old strike by union workers against Greyhound Lines, Inc., based here, is having an impact on the data processing departments of both Greyhound and its major competitor, Trailways, Inc. of Dallas.

The strike affects Greyhound's DP shop directly because about 70 data entry and keypunch personnel are union members and walked off their jobs along with the bus drivers. In addition, Greyhound programmers have been called upon to help out in understaffed sections of the company, performing duties that range from answering phones to washing buses in the company's garages.

To solve the data entry problem, work has been contracted out to temporary and personnel agencies. But "the worst thing is that programmers have been taken away from program development," according to Bob Wood, Greyhound's senior director of information systems. "A large number of programmers are working in the field."

## Mainframes Tied to Six Cities

Greyhound's DP network is based here, where an IBM 4341 Model Group 1 processor is installed, and in Cleveland, which has an IBM 3033. A Systems Network Architecture (SNA) network ties the mainframes to six cities using Datapoint Corp. 6600 small business computers and Attached Resource Computer local-area networks and, in San Francisco, a remote job entry system. The company's remaining 200 locations use terminals to access the mainframes via dial-up lines and about 130 IBM 3680 point-of-sale (POS) terminals that access the SNA network.

The overall strike experience is not a totally negative one, Wood said. With programmers scattered around the country using the remote terminals for scheduling and accounting, the programmers are getting to know the end users' problems firsthand. In addition, "It's great [public relations] for the data processing department to help run the company."

Field offices are not the only areas depending on the DP department. "When you're in a strike situation, your management wants to know how the business is doing," Wood said. "We've set up a command center to give management frequent updates" on ticketing and revenues.

## Beefed-Up Security

Security has been beefed up to ensure that none of the POS or data entry personnel attempt to sabotage the systems using their passwords. "You've got to take the same precautions you take when an employee leaves, but it's like you've got a 90% turnover," Wood pointed out.

Although Greyhound's buses are running at only 15% of capacity, Wood doesn't foresee any downtime for DP — but he does expect a backlog of at least two months because so many programmers have been called into the field. "Headquarters has been stripped bare," he said.

Another DP shop expecting a backlog as a result of the strike is at Trailways. With Greyhound working under capacity, Trailways is working over capacity to handle the overflow of bus riders.

"Our tickets are selling more and our payroll department needs more support because we're calling back furloughed employees," said Robert Zayas, Trailways' vice-president for management information systems. "We were still cleaning up some summer business when this happened. We'll still be busy two months after the strike."

General ledger and other revenue information is sent to Dallas by Trail-

*"Security has been beefed up to ensure that none of the POS or data entry personnel attempt to sabotage the systems using their passwords. 'You've got to take the same precautions you take when an employee leaves, but it's like you've got a 90% turnover,' Wood pointed out."*

ways agents who put their paper records on a bus each day, but most of the scheduling information is on-line via GTE Telenet, Inc.'s packet-

switched network.

The Trailways schedule reporting system is based on a Honeywell, Inc. Level 6 processor with remote asynchronous Teletype Corp. Model 43 terminals. The field offices route the scheduling information through Dallas for distribution to other field offices.

With more than 80 Trailways-owned stations and 2,000 commissioned agents, the average number of messages received on the scheduling network is 50,000. Zayas expects the number of messages to remain constant as their length increases with the rise in passengers and the need for more scheduling information.

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—Tom DeMarco

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# Justice Slams CRS Abuses, Calls for Regulation

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The Justice Department said recently that airlines providing computerized reservations systems (CRS) have used their services in anticompetitive ways, requiring federal regulation to prevent further abuses and to make air travel reservation practices more equitable.

In a detailed, 200-page filing with the Civil Aeronautics Board (CAB), which is trying to develop CRS rules, Justice said its investigation of the reservation systems — in particular American Airlines' Sabre and United Airlines' Apollo, the two major CRS offerings — found widespread attempts to use those systems to harm

competing airlines.

According to the filing, more than 50% of all airline ticket sales are made by travel agencies using CRS. Sabre and Apollo account for 70% of the industry, the department added. Other CRS mentioned in the study were Trans World Airlines' Pars system, Eastern Airline's System One and Delta Air Line's Datas II. Each of those five has dominant market shares in at least one urban area, Justice said.

## Claims of Biased CRS Displays

Airlines that do not have their own CRS can, for a price, make their reservation information available over the existing ones. Following claims that host airlines are biasing their CRS displays for their own benefit and denying competitors access to their systems — claims strongly denied by the CRS hosts — the Justice Department began an inquiry into the CRS industry in early 1982.

"The important conclusions," Justice said of its investigation, "are that CRS confers upon an airline host both market power and the technological ability to target rival carriers and that the incentive to use that power is always present." Specific abuses of CRS detailed by Justice included:

- From November 1981 to February 1982, American suppressed from

its CRS display Continental Airlines' "Supersaver" fares in 65 individual markets. "American decided not to match Continental's fares, but rather to remove them from Sabre's price-comparison display," Justice claimed.

- In 1981, New York Air entered the LaGuardia (New York City)-to-Detroit market in competition with American. "American altered Sabre's display logic so that New York Air flights would be buried far down in the display sequence." New York Air subsequently left the market after experiencing a drop in passenger volume, according to the filing.

"There is evidence that American's purpose was to punish New York Air for its entry and to intimidate New York Air so that it would not enter the LaGuardia-Chicago market in competition with American," the Justice Department added.

- There is also evidence that United "suppressed information on its Apollo system on specific Frontier, U.S. Air and, perhaps, Continental flights." Justice said evidence suggests United refused for 12 months to co-host Frontier, which competes directly in some markets, and did the same for shorter periods with respect to other airlines.

Justice added that American and United priced access to their systems using a strategy that considered the

extent to which other airlines seeking co-hosting competed with the CRS provider.

The "most effective and most insidious" way of using CRS against competitors, Justice said, is by biasing the display against competitors, which the filing said is now "pervasive." United and American can adjust bias on a market-by-market basis, Justice said.

"Not surprisingly," the filing said, "some rivals have shown trepidation about entering markets to compete with a dominant carrier that also hosts a CRS. A few carriers, such as Air Florida, Pan Am and Jet America, have even sought to gain favorable treatment on Apollo by suggesting that they would not compete intensely with United."

"It is unlikely, under current market conditions," the filing said, "that a new or expanding CRS can successfully challenge an incumbent carrier-owned CRS in the cities and regions where the incumbent has both a significant airline presence and a major share of the CRS market."

Justice noted that "the CRS industry is a young, technologically dynamic industry." Even though some regulation is necessary, "sound public policy" dictates that the government not "rush to impose public utility-type controls on the industry's prices or return on investment."

## How Art Blumenthal

"dumped the dumb"

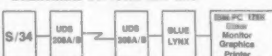


Art Blumenthal knows his stuff. An 11-year IBMer, he now heads the firm that is the largest third-party programmer for System/34 and System/36 in the Baltimore area.

Art and his staff used to use IBM 5251 Model 12 dumb terminals to communicate with clients. Now they use BLUE LYNX-equipped IBM Personal Computer, and get all the benefits of the PC's offline power.

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## Portable Micro Flies With Shuttle Today

By Jake Kirchner

CW Washington Bureau

CAPE CANAVERAL, Fla. —

When the space shuttle *Columbia* leaps into orbit today, it will carry a crew of six, a \$1 billion space lab for scientific experiments and a \$6,200 off-the-shelf personal computer to help the crew track its position and time its experiments.

Following lift-off, the 10-lb, 12½-oz. Grid Systems Corp. Compass computer, measuring only 15 in. by 11½ in. by 2 in., will be removed from a cabinet on-board the *Columbia* and placed on the instrument console between mission commander John W. Young and pilot Brewster Shaw.

On the machine's 6-in. diagonal screen will be displayed a replica of the giant mission control map in

Houston, showing shuttle orbits, mission elapsed time, day/night bands, indicators for the next Earth observation sight and time to arrival at the sight, location of the next ground communications site and satellite communications range and time to pick up and lose signals.

A real-time clock in the Compass will be set by the astronauts. The clock and map will allow the shuttle crew to know its exact location at all times, which will be particularly helpful during the times — 30% to 50% of each orbit — when the shuttle cannot communicate with mission control.

Before this flight, during the silent periods, the shuttle crew had to determine exact position using calculators and charts and maps, according to Grid Systems Vice-President

Bruce Walter. For general orientation, he said, "What they did prior to this was to look out the window."

The shuttle has, of course, other computers on board, including five general-purpose IBM processors and a small computer inside the space lab for scientific use. The space lab, developed over a 10-year period, rests inside *Columbia's* hold and will be the center for more than 70 experiments conducted by two astronaut/scientists, plus a scientist from Germany and one from MIT.

The Compass, however, is the first portable personal computer taken into orbit in the nine shuttle flights. According to Willard F. Lochridge IV, director of Grid Systems' federal systems marketing, the only modifications made to the machine for this ride were to replace the internal modem with an interior fan for heat dissipation in the zero-gravity environment, to add a new, shuttle-compatible power cord and to wrap the unit with several strips of Velcro to keep it from floating about *Columbia's* cabin.

The software for this application was developed by the National Aeronautics and Space Administration and is known as Spoc, or Shuttle Portable Onboard Computer. It is run under Grid Systems' Unix-like COS operating system.

According to Lochridge, this use of the Compass is experimental and was voted on board by the astronauts themselves after training with it in the shuttle simulator. In future flights, it could be used for additional purposes, such as figuring emergency landing procedures and sites, entering scientific data and keeping a mission log.



Mission control maps will be displayed on the Compass micro aboard the space shuttle *Columbia*. Shown here are orbit and night/day divisions.

## A Month After Nixing Home Computers

# TI Takes Wraps Off 16-Bit Business Portable

By David Myers

CW New York Bureau

NEW YORK — Texas Instruments, Inc. has announced a 27-lb transportable computer that is compatible with TI's desktop Professional Computer and features a 16-bit chip architecture.

TI's Data Systems Group took the wraps off the Portable Professional Computer at a press conference here last week. The micro, which sells for \$2,395 with a one-color display screen and \$2,965 with a color

screen, features a basic 64K bytes of random-access memory expandable to 768K bytes, offers up to 360K bytes of floppy disk storage and runs under Microsoft, Inc.'s MS-DOS 1.1 or 2.1 operating system.

While the machine puts TI into a highly active and potentially lucrative sector of the computer market, TI watchers are divided over the wisdom of the move in the wake of the Dallas company's \$600 million ditching of its home computer business last month. "Did they trade one bad situation for another? That's the question people will be asking," said Michael Van Deelen, analyst with Rauscher Pierce Refsnes in Dallas.

And James L. Barlage of Smith Barney, Harris Upham here in New York pointed to the intense competition in the market for portables and remarked, "They're getting right back into the same ball game. They're losing money in their [personal computer] business right now. This will just add to [the loss]."

On the other hand, some observers see the debut of the 5¼-in. floppy-based portable as a reaffirmation of TI's commitment to the office rather than to the home. They note that TI's home and portable computers are produced by two separate divisions.

"The marketplace should not con-

fuse this with the fiasco over the home computer. It's a sensible move in a market in which TI feels it has a role to play," said Gregory P. Richards, a stock analyst with Morgan Stanley & Co. here. "It shows TI is serious about staying in the business."

However, TI watchers seemed in general agreement that the new portable will not immediately help earnings recover from the financial bath TI took when it stopped manufacturing its 99/4A home computer.

The machine will be sold by TI dealers beginning next month. More information can be obtained from the firm through P.O. Box 225012, Mail Station 57, Dallas, Texas 75265.

## Surcharge Delay Still in Effect

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — It looked last week as though the Federal Communications Commission (FCC) would stick with its earlier decision and delay for three months surcharges for access to the long-distance telephone network.

Last month, immediately after the commission deferred these charges from Jan. 1 to April 3 [CW, Oct. 24], AT&T, and then the soon-to-be-divested Bell operating companies, asked for reconsideration. The telephone companies charged that establishing interim arrangements for AT&T to reimburse the local carriers during the three-month hiatus would be very costly, tie up personnel needed for divestiture-related activities, reduce Bell operating company revenues and add to the investor confusion created by divestiture.

The U.S. Department of Justice initially agreed with the telephone companies, maintaining that the three-month suspension would "unnecessarily and inordinately complicate" divestiture [CW, Nov. 21]. But soon afterward, AT&T and Bell Atlantic, one of the seven new regional holding companies created by the breakup of the Bell system, agreed on a plan under which the former will pay the latter for access during the three-month interim period. All the other Bell regional companies subsequently agreed to this plan.

The carriers continue to insist that the FCC's three-month delay in imposing access surcharges on residential and business users will be onerous, despite the interim agreement. As AT&T pointed out in a comment to the commission Nov. 16, calculating the payments due the Bell operating companies will be "difficult and time-consuming." AT&T also said the Bell operating companies will not earn as much under the interim scheme as they would during the same period under the FCC's plan.

Justice, however, said that if the FCC decides to stick with the April 3 date, "the approach now agreed to by AT&T and the [operating companies] minimizes, to the extent possible, potential conflicts between the FCC suspension order and the Modified Final Judgment," the agreement settling the government's antitrust case against AT&T, and the department will support it.



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## Another Year; No Crime Bill

(Continued from Page 1)

on computer crime. They include:

- The Nelson bill, H.R. 1092, the direct descendant of the original 1977 bill, which would set penalties for misuse of computers in federal and interstate use.

- A get-tough bill, recently introduced by Rep. Lawrence Coughlin (R-Pa.) and numbered H.R. 4301, that is only three paragraphs long — just long enough to mandate penalties of up to 10 years in jail and/or \$100,000 in fines for anyone using a computer in federal and interstate commerce without authorization.

- Two new bills from Rep. Daniel A. Mica (D-Fla.) — H.R. 4259 and an updated version, H.R. 4348, titled the Computer Fraud Prevention Act, which would not only set penalties for unauthorized computer use but also establish a government Computer Security Research Program and an Interagency Committee on Computer Crime and Abuse.

- Besides the Senate counterparts to most of these bills, there are also several bills that concern computer crime, including bills directed at credit card fraud and a bill already passed by the House to establish a Small Business Administration task force to educate and assist small businesses in their efforts to protect themselves from computer crime.

Nelson, Coughlin and Mica all appeared before the Edwards panel Nov. 18. They all said basically the same thing: It is time to pass some form of federal legislation on computer crime.

Rep. Dan Glickman (D-Kan.), whose Transportation Aviation and Materials Subcommittee recently held several days of hearings on computer security and crime, also suggested that the issue is so important that it may require that a separate congressional subcommittee be established.

### Barriers to Legislation

At this point, three major barriers to passage of such legislation remain: the belief, particularly by Edwards, that the computer crime problem might be more effectively and more properly tackled at the state level; lack of strong support from the private sector, especially the DP community, which seems to prefer additional study before legislation; and the lack of a firm Reagan administration position on the federal legislation.

John C. Keeney, deputy assistant attorney general and head of the Justice Department's Criminal Division, told the Edwards subcommittee that "the administration is actively reviewing various legislative proposals in this area, but at this juncture we have not yet reached a final decision on what type of new legislation we believe is needed."

Keeney said the Nelson bill is preferable to the short but tough approach of the Coughlin bill and told the subcommittee that an administration recommendation on legislation will be made to Congress soon.

Speaking for the Federal Bureau of Investigation, Floyd I. Clarke, head of the bureau's Criminal Inves-

## Lawyer Advocates Federal Crime Law

WASHINGTON, D.C. — Although Congress has been reluctant to pass federal computer crime legislation, among those who have backed the idea for the six years it has been before Congress there is little doubt that a federal law is needed to curb growing misuse of computer systems.

One such supporter is August Bequai, a Washington attorney who has written a half-dozen books on computer and white-collar crime and who helped draft the original federal bill, introduced in 1977 by then-Sen. Abraham Ribicoff (D-Conn.).

"Present criminal laws at the federal level really are not adequate to address computer-related crime. They really have not been adequate in general to address white-collar crime," Bequai told *Computerworld* in an interview last week.

States cannot effectively fight computer crime, he said, because many of the crimes are interstate or international in nature and because, except for a few large states such as California and New York, states do not have the resources to counter these crime problems.

Noting that there are dozens of laws that might be brought to bear against computer criminals, he said, "You want to have something that addresses a specific problem." Today that body of law "is like a junkyard where you have lots of cars because 98% of them you can't drive; they're outdated."

In addition, he said, there are economic reasons to have a specific federal statute against computer crime. Because a defendant knows it is difficult to bring him to trial under this amalgam of laws, "he might not be that hesitant to go to trial and to appeal" rather than plead guilty or seek a bargain with prosecutors.

Further, he said, a new law would force investigators, prosecutors and judges to learn about computer crime, how to detect it and how to handle it in a courtroom.

But, he cautioned, "a federal computer crime law is not going to answer all questions. It won't be a quick fix — there is no quick fix." Besides the law, there will have to be better education of law enforcement about white-collar crime in general and higher ethics in the computing community.

tigative Division, would only say that although prosecution of these crimes might in the future be aided by a federal law, "we in the FBI have not had, to date, any significant problems in prosecuting ... under

existing statutes over which we have jurisdiction, such as the fraud by wire statute."

Although Congress adjourned without acting on any of these bills, the legislation will still be up for

consideration when Congress returns in January. The sponsors of the legislation are already promising renewed efforts to move some form of federal computer crime bill through Congress at that time.

## Senate Report on Federal DP Security Cites Poor Management in Oversight Agencies

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — A U.S. Senate report on federal computer security suggested that few agencies adequately manage DP security programs and said that all government oversight agencies share the blame for this situation.

"A lack of understanding of the problem, coupled with a reluctance to commit resources for the computer security effort, are major barriers to instituting good security practices," said the report, which was released by the Government Affairs Permanent Subcommittee on Investigations. Titled "Federal Computer Security: An Analysis of Congressional Initiatives and Executive Branch Responsibilities," the report was pre-

pared by Louise G. Becker of the Congressional Research Service, a branch of the Library of Congress.

In the report, Becker pointed to a failure of the central agencies to provide adequate security measures and direction for agencies. Particularly singled out for criticism was the U.S. Office of Management and Budget, which, according to the report, has failed to live up to its responsibilities under federal information management laws.

In addition, the General Services Administration, which is responsible for federal procurement practices, has failed to insist on adequate protection measures for federal computer acquisitions, according to the report. Moreover, the National Bureau of Standards' Institute for Computer

Sciences and Technology was said to be unclear about its mission in this area and lacked adequate funding to carry it out, anyway.

Spreading the blame even further, the report suggested that too many resources for DP security research and development have been given over to the U.S. Department of Defense. Noting that Defense was concentrating on development of "trusted" computers, the report suggested that the results of that technical approach may not be transferable to civilian agencies and the private sector.

The report also pointed to criticisms of Defense with respect to concentration of computer security R&D within its supersecret National Security Agency.

### 'Not Vital' to Postal Service

## Report Calls Ecom a Taxpayers' Boondoggle

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Electronic Computer-Originated Mail (Ecom), the controversial service offered by the U.S. Postal Service (USPS), is a waste of the taxpayers' money, a U.S. House of Representatives government operations subcommittee angrily concluded in a report released last week.

The Postal Service "deliberately manipulates the release of information about Ecom to make [it] appear to be more successful than it really is," the report contends.

The subcommittee also accused Ecom's managers of violating postal rules and of refusing to make some information about a pending rate increase available to the public. The proposed rate — 31 cents for a one-page Ecom message and 40 cents for

two pages (the present charges are 26 cents and 31 cents, respectively) — is based on a projection that the number of messages the service carries in 1987 will be sufficient to make revenue balance costs. According to the subcommittee, using a "test year" this far in the future explicitly violates the Postal Service's Rule of Practice 54.

According to the subcommittee, this and all other Postal Service market projections are suspect. One reason is that the Postal Service "does not measure costs and revenues in constant dollars and does not consider the time value of money." Also, "the data upon which the Postal Service bases its request for [higher] Ecom rates are subjective and unreliable."

In the past, the commission observed, "actual volume has always

been below the Postal Service's estimates."

Possibly the most significant conclusion of the report is that "Ecom, as currently configured, is not vital to the long-term viability of the Postal Service."

Even if Ecom generates the message traffic projected by USPS for 1987, it will represent "less than one-third of 1% of total Postal Service mail volume," according to the subcommittee. Quoting an August 1982 study by the Office of Technology Assessment, a congressional research agency, the report said that "under any plausible scenario, USPS is still likely to be handling 70 billion to 110 billion pieces of mail in 2000," and by that year, the mail volume transmitted and delivered by electronic message systems like Ecom is expected to start declining.



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# Micro-Mainframe Links Called Problematic

By Robert Batt

CW West Coast Bureau  
PALM SPRINGS, Calif. — Managers of information systems will come under increasing pressure as more sophisticated micro-to-mainframe links are developed, a senior IBM manager warned here last week.

Robert Berland, director of IBM's Information Programming Services, said at the Enterprise Information Systems Forum that the data processing community has not even scratched the surface of the problems and opportunities that the micro-computer calls forth.

"We haven't even begun to witness the pressure that

## CW at EIS

will be placed on the mainframe once host computer software and personal computer software truly work together. When that happens, there will be an absolute explosion of [millions of instructions per second] and [direct-access storage device], which will result in computing power going to people who never use the host," he asserted.

Berland told the forum, sponsored by Enterprise Information Systems, Inc., a Greenwich, Conn., market research firm, that with the

proliferation of personal computers in large organizations, definitions of size are changing very rapidly. "Software relationships between hosts and personal computers are going to drive us to new notions of size as dynamic business needs continue to expand, thereby dictating rapid growth of on-line usage and more responsive DP solutions," he continued.

The relationship between personal computers and the management information systems (MIS) department

must be part of a "synergistic whole," Berland contended. This will put more emphasis on the place of information processing within an organization.

Already, he said, some DP managers are acting as consultants to senior managers not only on MIS concerns, but on how best to run the overall corporation. They have attained this position of influence because of the unique view that MIS directors have on the flow of information in an organization.

"While only a small number of MIS managers currently play this role, as time goes on, more and more corporations will use their DP people in this fashion," Berland predicted.

The No. 1 requirement for DP personnel, particularly those working in the information and application development centers, is to be tremendous communicators and superb company politicians because of the increasing need to interface with many other areas of the organization. This will change the nature of the DP department's job, Berland remarked.

The trend toward greater end-user involvement in computing means that DP specialists will increasingly be required to perform prototyping in concert with the end user. "One of the mistakes DP personnel make is that they want to do prototyping in a way that it becomes the production system," Berland remarked.

Turning to the efficient use of DP resources, Berland



"We haven't even begun to witness the pressure that will be placed on the mainframe once host computer software and personal computer software truly work together," Robert Berland, director of IBM's Information Programming Services, said last week.

claimed that a whole area of applications exists that should never become the domain of the DP department. For example, Berland contended, the vast majority of company reports should be generated by end users rather than by the DP department.

"We need to give end users the appropriate tools, such as report writer capabilities on personal computers, so that they can get the data they want and send information to the people who need it, instead of getting the DP function bogged down in generating the report," Berland told his audience.

## Exec Details Key Design Elements Of a Successful Relational DBMS

PALM SPRINGS, Calif. — The key elements of data base management system (DBMS) design involve a number of trade-offs that cannot be ignored, a senior industry executive said here last week.

Umang Gupta, vice-president of Oracle Corp.'s Micro-computer Products Division, said concurrence vs. data integrity, CPU capacity vs. I/O intensity, query vs. update performance and transaction recovery vs. performance are the key issues to be considered in any relational data base design.

Higher performance data base systems will be more memory-intensive than disk-intensive, Gupta said at the Enterprise Information Sys-

tems Forum.

"A well-designed relational [DBMS] in its most elemental form can be defined as a series of algorithms that ensure data searches take place in memory, where possible, and avoid the use of expensive disk resources. This is especially important in systems that have a large amount of users and deal with vast quantities of data," Gupta noted.

Turning to other trade-offs, Gupta said that in a multiuser, transaction-oriented environment, the need both to improve concurrence while not sacrificing data integrity and to optimize queries without sacrificing update and in-search schemes are vital to the success of a

relational DBMS.

Regarding the trade-off between transaction recovery and performance, Gupta said multiple data base operations often comprise one logical operation. Automatic transaction-level rollback and recovery are useful for maintaining data integrity; the key is to provide a high level of recovery without seriously downgrading performance.

Users, he told his audience of DP professionals, want fast, easy-to-use and portable data base systems. At the same time, the management information systems (MIS) manager cannot allow the propagation of multiple systems because of the expense of training employees and the cost of developing and maintaining such an arrangement.

Therefore, the former IBM marketing manager added, the primary issue confronting DP specialists is how to obtain a standard that can operate in a number of different environments. "While the MIS manager cannot dictate the use of hardware very often, he can manipulate the software environment," he said.

Another issue, he said, is that data base systems must be at least equal to, and for the most part better than, the information center products currently using mainframes, including fourth-generation languages such as Ramis, Focus and Nomad.

Another forum speaker, Robert Berland, director of information programming services at IBM, also addressed the issue of data base design. Berland stressed the need to simplify data base design and to ease the change to a data base structure.

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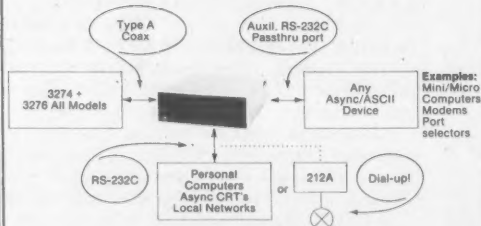
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# Merger of Data, Voice, Video Cited Clamor for Micro Standards Heard at Forum

By Robert Batt

CW West Coast Bureau

PALM SPRINGS, Calif. — The increasing clamor for standards to deal with the impact of personal computers in large organizations was much in evidence at last week's Enterprise Information Systems Forum.

At a session here on "Local-Area Networking Requirements for Large Organizations," Ralph Ungermann, president of Ungermann-Bass, Inc., the California manufacturer of general-purpose local-area network systems, said the merger of data, voice and video will dictate an increasing need for standardization.

"While these three markets are currently distinct, as new local-area networks develop they will begin to merge," Ungermann said. "The ability

to connect different media is essential to the long-term viability of the industry and critical to the success of this is the adoption of and adherence to industrywide standards."

The availability of local-area networks will lead to an explosion of application software development, Ungermann predicted, suggesting that the key to the successful management of this new technology is a system approach that builds on products recognized as standards, with a strong emphasis on network management facilities.

"Managers need to configure complex networks and change them dynamically to meet business needs. This is a serious problem, given the wide range of differences between different vendor products," he ex-

## CW at EIS

plained. For example, he said, just maintaining a multivendor local-area network is difficult because fault detection and isolation is a complex process.

The growth of personal computers and powerful workstations is creating a demand for local-area networks, Ungermann said. As these units grow in numbers, users will constantly require more bandwidth, so the development of a system to account for who has what is essential, as is support for the development of new or enhanced software.

Success in this area, he stressed, will be greatly aided by the rapid

adoption of standards.

The issue of standards was also addressed by Esther Dyson, president and owner of Rosen Research. In a keynote address to the forum, Dyson claimed the increasing trend toward more horizontal data architectures is spurring a greater need for standardization in microcomputer software.

"The world needs many more standards in application development tools. What makes a product good is whether it becomes a standard. . . . For personal computer vendors, the trick is to build up a cadre of application software," she said.

In this development, the role of IBM will be crucial, Dyson maintained. For example, in the rapidly growing area of products with window facilities, an endorsement of one particular product by Big Blue would determine the winner, she said.

Currently leading the contenders with window products — which allow several applications to be viewed simultaneously and permit the interchange of data — is Visicorp, with its Vision product. However, Microsoft, Inc. of Bellevue, Wash., recently came out with its own product, called Windows. Announcements of window products are expected from Digital Research, Inc. and Softech Microsystems, Inc. at this week's Comdex/Fall '83 show in Las Vegas.

## House Panel OKs CATV Nonregulation

WASHINGTON, D.C. — A U.S. House of Representatives telecommunications committee earlier this month approved legislation barring the regulation of nonvoice communications services offered by CATV companies. Although a similar bill (S. 66) has been approved by the U.S. Senate, proponents of nonregulation

face an uphill fight.

Rep. John Dingell (D-Mich.), chairman of the House Commerce Committee, believes CATV networks that provide common carrier-type transmission should be regulated as common carriers, and a substantial number of his colleagues on the 42-member committee reportedly agree.

Since the recently approved House bill (H.R. 4103) must be considered by Dingell's committee before it can go to the floor for a final House vote, this opposition is significant.

A committee source said last week there is "no rush" to bring the legislation before the committee. Asked about the likelihood of action next March or April, he said the chances are "50/50."

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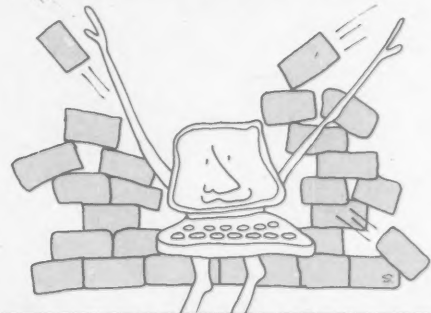
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# Within Multiple-Computer Environments Flexible Info Management Structure Sought

By Robert Batt

CW West Coast Bureau

PALM SPRINGS, Calif. — A comprehensive and flexible integrated information management structure is necessary for the successful development of a multiple-computer environment.

That was the main theme of a paper presented to the Enterprise Information Systems Forum here last week by David Britton, founder and president of Britton-Lee, Inc., a firm specializing in data base machines. In the paper titled "Personal Computers, Mainframes and Data Base Servers," Britton said the problem of managing burgeoning corporate in-

## CW at EIS

formation is just beginning to occur to managers of information systems.

"With the rapid proliferation of desktop personal computers throughout the business environment and the enthusiasm of their users, the traditional structure has changed," said Britton, who was formerly vice-president of marketing at Zilog, Inc. The advent of easily accessible and affordable micros has caused users to bypass the traditional DP structure and acquire computers independently.

"This has, in effect, allowed other departments to develop their own DP capabilities without the expertise and overview of the main-line DP specialists. The important task is to integrate these powerful personal computers into the corporate information system. This, in turn, will place demands on the DP organization far more challenging and complex than ever before," Britton added.

Integrated information management teams must be developed internally, drawing on personnel from all levels of the company, Britton said. "Through the process of thorough review and planning, a comprehen-

sive and flexible integrated information management system can be developed and implemented. The immediate priority is to plan and implement such a concept before a catastrophe occurs."

Britton argued that a new and serious problem has arisen with the unbridled growth of personal computers in large organizations and increased user sophistication — the need to integrate corporate information in a way that satisfies today's corporate demands. To achieve this goal, he continued, two key factors are essential.

First, the personal computers involved must respond quickly and efficiently access the corporate data bases. Secondly, mainframes and their accompanying DP staff must retain control to monitor and ensure data base integrity.

### Incorporating Innovations

"Once a system is developed and put into use, it is very difficult to incorporate major innovations," Britton noted. "The tendency is to massage existing technologies rather than to seek alternatives that attack the root of the problem."

"Therefore, a comprehensive integrated information management solution must be thoughtfully planned and designed to allow for next-generation technologies and, ideally, the technologies anticipated after that."

A well-designed integrated information management system, Britton said, will allow the DP organization to continue performing the functions required by the mainframe, while the manipulation and transportation of data to the user is virtually transparent. It would have the ability to manage and responsibly disseminate information from a common data base to various computers, regardless of manufacturer or operating system, Britton said.

"Properly designed and integrated, such a system will minimize the necessity of programmer involvement and allow the user to perform work virtually independent of the DP organization," according to Britton.

## Brown, IBM Sign \$15 Million Pact

PROVIDENCE, R.I. — Brown University recently signed a three-year, \$15 million agreement with IBM for computer equipment and research of educational uses of computers.

By 1990, the school plans to have a network of 10,000 workstations, making one available to each student, faculty and staff member, according to a Brown spokesman.

In the first year of the agreement, Brown will receive a \$450,000 cash grant for research and a \$750,000 grant in the form of 100 personal computers. The computers will be used for software development in subjects such as sociology, anthropology, physics and biology.

Brown has also received donations from Apple Computer, Inc. and Apollo Computer, Inc.

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UNIX Fundamentals for Non-Programmers*	Jan 11-13	Nov 2-4 Mar 7-9	Nov 9-11 Jan 11-13 Mar 7-9	Oct 12-14 Nov 16-18 Mar 14-16	Oct 19-21 Dec 7-9	Jan 4-6 Feb 22-24 Apr 4-6	Jan 4-6	\$ 735	
UNIX Fundamentals for Programmers*	Jan 16-18	Oct 3-5 Nov 7-9 Mar 12-14	Oct 3-5 Nov 14-16 Jan 16-18 Mar 12-14	Oct 17-19 Nov 28-30 Mar 19-21	Oct 24-26 Dec 12-14	Jan 9-11 Feb 27-29 Apr 30- May 2	Jan 9-11	\$ 735	\$1125
Shell as a Command Language*	Jan 19-20	Oct 6-7 Nov 10-11 Mar 15-16	Oct 6-7 Nov 17-18 Jan 19-20 Mar 15-16	Oct 20-21 Dec 1-2 Mar 22-23	Oct 27-28 Dec 15-16	Jan 12-13 Mar 1-2 May 3-4	Jan 12-13	\$ 490	
"C" Language Programming*	Jan 23-27	Oct 10-14 Nov 14-18 Mar 19-23	Oct 10-14 Nov 28- Dec 2 Jan 23-27 Mar 19-23	Oct 24-28 Dec 5-9 Mar 26-30	Oct 31- Nov 4	Jan 16-20 Mar 5-9	Jan 16-20	\$1225	\$1125
Shell Programming*	Jan 30-31	Oct 17-18 Nov 28-29 Mar 26-27	Oct 24-25 Dec 5-6 Jan 30-31 Mar 26-27	Oct 31- Nov 1 Dec 12-13 Apr 2-3	Nov 7-8	Jan 23-24 Mar 12-13	Jan 23-24	\$ 490	
Using Advanced UNIX Commands*	Feb 1-3	Oct 19-21 Nov 30- Dec 2 Mar 28-30	Oct 26-28 Dec 7-9 Feb 1-3 Mar 28-30	Nov 2-4 Dec 14-16 Apr 4-6	Nov 9-11	Jan 25-27 Mar 14-16	Jan 25-27	\$ 735	\$1375
UNIX Internals	Feb 6-10	Oct 24-28 Dec 5-9 Apr 2-6	Oct 31- Nov 4 Dec 12-16 Feb 6-10 Apr 2-6	Nov 7-11 Apr 30- May 4	Oct 3-7 Nov 14-18	Jan 30- Feb 3 Feb 21-25 Mar 19-23	Jan 30- Feb 3	\$1375	
UNIX Administration*	Feb 14-16	Apr 10-12	Feb 14-16 Apr 10-12	May 8-10		Feb 7-9 Mar 27-29	Feb 7-9	\$ 735	\$1125
Advanced "C" Programming Workshop*	Feb 27-29	Apr 30- May 2	Feb 27-29 Apr 30- May 2	May 14-16		Feb 13-15 Apr 2-4	Feb 13-15	\$ 735	
Advanced "C" Programming Under UNIX*	Mar 1-2	May 3-4	Mar 1-2 May 3-4	May 17-18		Feb 16-17 Apr 5-6	Feb 16-17	\$ 490	\$1225
Berkeley UNIX Fundamentals and "csh" Shell*				April 9-13			Feb 27- Mar 2	\$1225	

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## CW at Comdex/Fall '83

# Micro Alive, Well at Comdex Despite Rumors

By Jeffrey Beeler

CW West Coast Bureau

LAS VEGAS — Prophets of an impending shakeout in the personal computer industry will find precious little evidence to support their gloomy forecasts at Comdex/Fall '83, which begins a five-day run here today.

Among the microcomputer-oriented conference's expected 1,400 exhibitors will be more than 300 vendors who will be participating at Comdex for the very first time. "Most of those 300 companies are start-ups," noted Peter Young, public relations director for the Needham, Mass.-based Interface Group, the show's organizer.

The presence of such a large contingent of start-up exhibitors flatly contradicts a recent spate of dire predictions that the ranks of the personal computer industry are about to be drastically thinned, Young said. "We don't foresee any shakeout coming to the personal computer industry. On the contrary, the industry will continue to grow. Its lifeblood is still pumping away vigorously."

Underscoring the industry's continuing prosperity has been the

steady, year-to-year increase in Comdex attendance. Last fall, the show attracted some 50,000 attendees. This year, the head count at the event is expected to total 80,000.

### Largest Show Here This Year

As the largest trade show of any sort to hit the Las Vegas Convention Center this year, Comdex will "put tremendous pressure on [that city's] infrastructure," Young said. "Hotel rooms are already as scarce as proverbial hens' teeth."

In the past, Comdex has been geared primarily to a national audience of independent sales organizations and other intermediate resellers, and this month's show is expected to be no exception. "We don't foresee any major departure this year from our traditional content or emphasis," Young said.

Like most of its predecessors in the Comdex series, the fall '83 conference will undoubtedly serve as a major launching pad for scores, if not hundreds, of product introductions. Although the expected announcements will be spread over a multitude of generic product classes, some of the categories will inevitably gen-



Attendees crowd last year's exhibit floor at Comdex, also held in Las Vegas. More than 80,000 people are expected to attend this year's show.

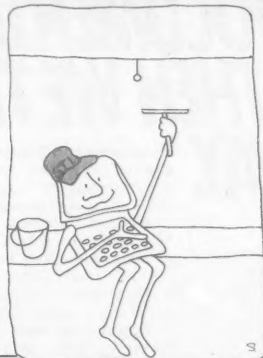
erate more unveilings and visitor interest than others.

The volume of introductions is expected to be especially heavy in product classifications, such as micro-to-mainframe links and local peripherals, particularly disk systems and printers, Young said. Product announcements will also be unusual-

ly plentiful among suppliers of portable and transportable personal computers.

In addition, Young said, many of the product introductions at Comdex/Fall '83 will come from Japan — a continuing sign of "Japan's careful, methodical expansion into the U.S. marketplace."

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## CW at Comdex/Fall '83

# Insiders Discuss IBM Micro-Compatible Mart

By Paul Freiberger  
Special to CW

How many companies will be able to elbow their way into the IBM Personal Computer-compatible market? At least three more companies — Vector Graphic, Inc., Panasonic Co. and Visual Technology, Inc. — have recently announced machines designed to run software developed initially for the IBM Personal Computer. All of them will be exhibited this week at the Comdex/Fall '83 show.

"I think the market will support fewer compatibles than it has," said Esther Dyson, president of Rosen Research, a high-technology market research company.

But in order to make a new ma-

chine appealing to the microcomputer consumer, each vendor must persuade software firms to modify their programs for its machine. Thus the micro vendors often develop machines that can tap a wide existing array of packaged software.

"We like true IBM [Personal Computer]-compatible machines," said Mitch Kapor, president of Lotus Development Corp. of Cambridge, Mass., developer of the Lotus 1-2-3 software program.

Software companies will, on the other hand, modify machine-specific programs for an incompatible machine if it appears to have a good chance at commercial success and if the new machine promises to exploit the capabilities — such as graphics

— of a program.

"We'll change our products to support a market," Terry Opdendyk, Visicorp president, said. Visicorp is creating a more graphics-oriented version of its new Vision operating environment for the Wang Laboratories, Inc. Professional Computer, which offers higher resolution graphics than the IBM Personal Computer, Opdendyk said.

Hardware firms that depend on major software firms like Visicorp and Lotus to support their machines face the problem of being lumped together. In an effort to stand out from the pack, the latest IBM Personal Computer-compatibles thus offer different features, at varying prices.

"It's not designed to be a [Personal Computer]-compatible," said Ron Tharpe, director of marketing at Vector Graphic, referring to Vector's newly released 4-S system. Rather, it is "a step toward compatibility."

There are already several machines that run most IBM Personal Computer programs without modification. Vector Graphic's answer to the challenge is to sell a machine with features not available on the IBM Personal Computer or its clones. Such an approach could appeal to software companies like Software Arts of Cambridge, Mass., developer

of TKSolver. Dan Bricklin, company chairman, reiterated that he likes machines that can help differentiate his software from its competitors.

In addition to running 16-bit software with an Intel Corp. 8088 microprocessor, the new 4-S (like the Vector 4) comes with a Zilog, Inc. Z80 microprocessor, which can run older 8-bit Digital Research, Inc. CP/M software.

The new Vector Graphic quad-density drives can store more information than an IBM Personal Computer disk drive. A system with a single floppy disk drive and a 5M-byte hard disk drive is priced at \$4,995. Several other configurations are available, the vendor added.

Panasonic has opted for a lower cost, 28-lb portable machine called the Sr. Partner. This machine comes with a built-in printer and several application programs and is compatible with the IBM Personal Computer. It will sell for \$2,495.

Visual Technology, Inc. in Tewksbury, Mass., is also emphasizing compatibility and portability in its new 16-lb machine. The Commuter is designed to fit in an attache case. It is priced at \$1,995.

Freiberger is a senior editor at Infoworld, a newsweekly for microcomputer users based in Menlo Park, Calif.

## 'Baby/34' Software System to Bow

LAS VEGAS — Comdex/Fall '83 held here will offer the first opportunity for California Software Products, Inc. to present its software system that allows programs written in RPG-II for the IBM System/34 to be moved to and executed on the IBM Personal Computer.

The system, Baby/34, reportedly allows entire business applications systems that have been used for years on the System/34 to be used on the

Personal Computer.

The system includes a data exchange utility, operations control language, RPG-II compiler, workstation I/O, screen format generator, source entry utility, data file utility and sort.

The system is available immediately for \$2,500 in the U.S. from Software Products, located at 525 N. Cabrillo Park Drive, Santa Ana, Calif. 92701.

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## CW at Comdex/Fall '83

# Visual Computer to Introduce 16-Lb Portable

LAS VEGAS — Visual Computer, Inc. will introduce at Comdex/Fall '83 here a 16-lb, 16-bit portable computer said to be compatible with the IBM Personal Computer. Packaged in a 15- by 18- by 3-in. case, it is also said to fit in a briefcase.

Standard features on the Commuter include 128K bytes of random-access memory, expandable to 512K bytes; Microsoft, Inc.'s MS-DOS operating system; an 83-key, full-stroke keyboard with functions and layout identical to IBM's; and a 5¼-in., double-sided, double-density disk drive,

according to a spokesman for the vendor.

Also standard on the machine are bit-map color graphics support, a parallel port, an RS-232C serial port, composite video output and a connector for integral IBM expansion-chassis support for additional IBM memory cards and hard disks, the vendor spokesman claimed.

An 80- by 16-char. LCD is optional; support logic for the same display and a 40- by 25-char. display is standard. This is said to provide the logic for high-resolution mono-

chrome and color displays, black-and-white display or color television.

The Commuter includes communications options such as an RS-232C port that will provide asynchronous communications as well as IBM's Binary Synchronous Communications and Synchronous Data Link Control.

The microcomputer is available for \$1,995 from Visual Computer, which is located at 135 Maple St., Marlboro, Mass. 01752.



Visual Computer, Inc.'s Commuter

## Micro-Based Modem to Bow From Anderson Jacobson

LAS VEGAS — Anderson Jacobson, Inc. will introduce this week at Comdex/Fall '83 a microprocessor-based modem said to incorporate touch-controlled front-panel switches and indicator lights, multispeed operation and integral power supply on a single board.

The AJ 1212-ST low-profile 300-1,200 bit/sec modem is an originate,

manual or autoanswer modem for switched telephone network operation in both Bell 212A and Bell 103/113 protocols. It automatically identifies incoming calls and sets itself according to the appropriate data rate, according to a vendor spokesman.

It will be available for \$495 in January from Anderson Jacobson, 521 Charcot Ave., San Jose, Calif. 95131.

## Comdex Menu: Room-Service News Available to Conventioneers via TV

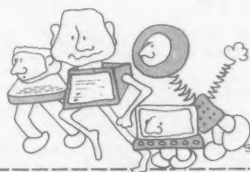
LAS VEGAS — Attendees of Comdex/Fall '83 will be able to view a daily show update, interviews and other show news in their hotel rooms via special closed-circuit television broadcasts from the Las Vegas Convention Center.

Comdex Today, a production of the Las Vegas-based Convention Television Network (CTN), will provide 24-hour-a-day programming throughout the show into more than 22,000 hotel rooms in

the Las Vegas area. A different two-hour segment will be prepared each day and shown 12 times during the day.

Each day's Comdex Today segment will include interviews with industry leaders, new product information and on-the-spot coverage of Comdex events, according to CTN President Barry Lenett. Additionally, 16 major companies will be featured in sponsored segments, which provide the funding for the broadcasts.

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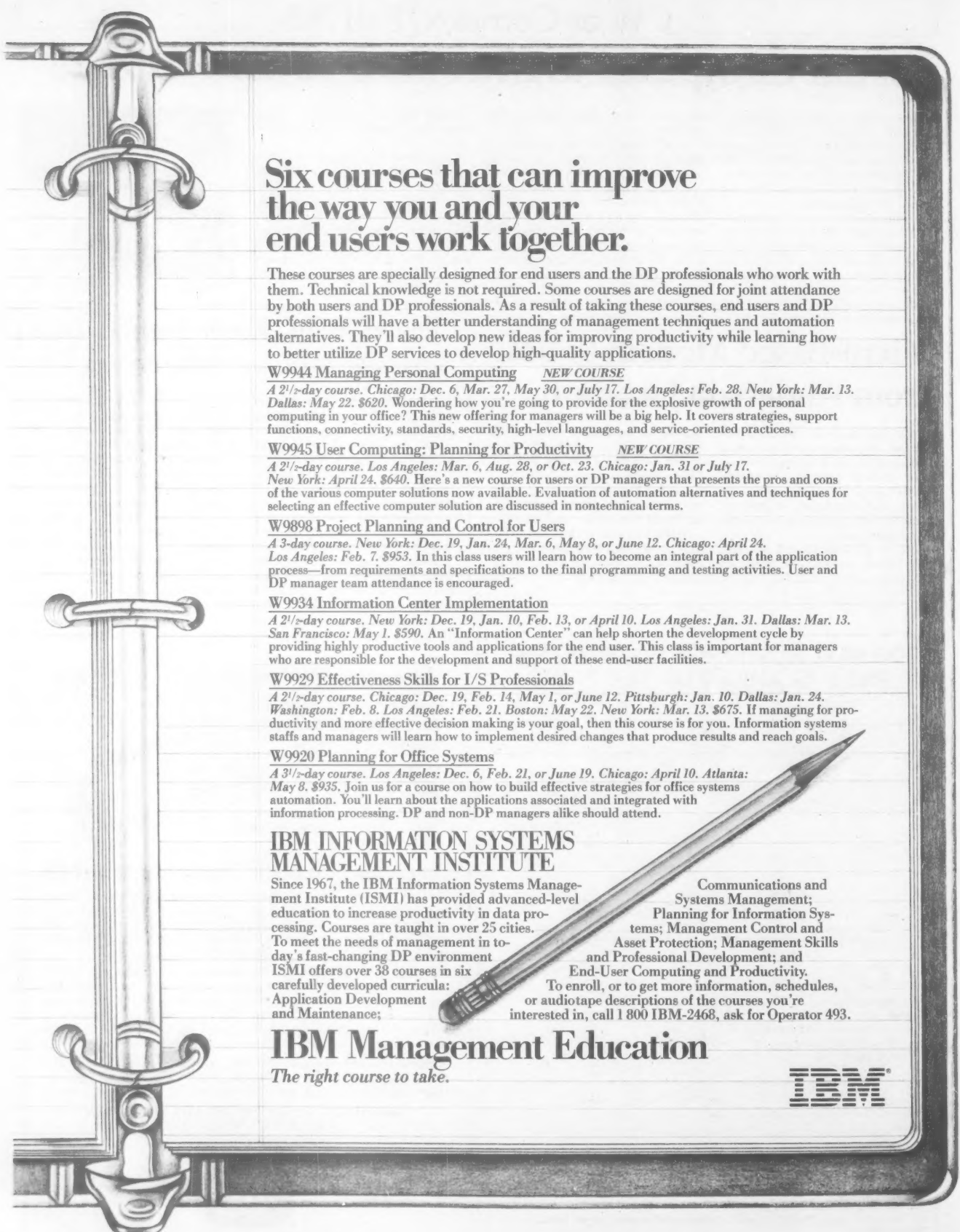
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## This Week at Comdex/Fall '83

# North Star Enters IBM Micro-Compatible Arena

By Michael Swaine

Special to CW

SAN LEANDRO, Calif. — One of the latest entries into the IBM Personal Computer-compatible arena is a multiuser system from North Star Computers, Inc.

The vendor is now looking for a hospitable habitat in the IBM market environment, and North Star President Chuck Grant is hoping that he has found it with Dimension, his company's recently announced Intel Corp. 80186-based multiuser system.

Grant insisted that Dimension "is not just another IBM clone," pointing out that the multiuser system is more cost-effective than single-user systems.

Furthermore, North Star is banking on more than a price advantage to set its product apart from the herd. Dharam Ahuja, North Star vice-president of sales and marketing, believes the Dimension system will appeal to management information systems (MIS) managers in Fortune 1,500 companies who are disturbed by the onslaught of personal computers in corporations.

To back up such claims, North Star is also planning to release communications links for the Dimension that

will allow it to communicate with IBM mainframe computers.

"Our challenge was to identify a market need that no other company had addressed," Grant said. The Intel 80186 microprocessor in Dimension's central module represents the next step up in the family of chips that includes Intel's 8088. Monroe Systems for Business, Inc. recently announced plans to bring out a single-user system based on the Intel 80186 chip, but North Star appears to be the first to incorporate it into a multiuser system.

The North Star machine is based on a central processor box or module that can control two to 12 Personal Computer-compatible workstations. The central module is reportedly the key to Grant's strategy to stake out

new territory.

Each workstation linked to the central module has the chief features of an IBM Personal Computer, including an Intel 8088 microprocessor (running at a faster clock speed than the Personal Computer's — 7 MHz vs. under 5 MHz), 128K bytes of random-access memory (RAM), a Personal Computer-compatible keyboard and a monochrome monitor with the same resolution as the Personal Computer.

Each workstation can be running a different IBM PC-DOS program simultaneously while sharing central disk storage, according to the vendor. The individual workstations have no local disk storage, since the main unit includes one or more 15M-byte or 30M-byte hard disk drives

and a 360K-byte floppy disk drive, the vendor said.

The central module also includes 256K bytes of RAM, used chiefly to speed data transfer between the workstations and the hard disk, the vendor explained.

A system with two workstations, an operating system compatible with IBM's PC-DOS Version 2.0 and a 15M-byte disk drive will be priced at \$7,000 when North Star starts shipping the Dimension in the first quarter of 1984.

Additional workstations will cost \$1,500 each from North Star Computers, 14440 Catalina St., San Leandro, Calif. 94577.

Swaine is a senior editor at Infoworld, a newsweekly for microcomputer users based in Menlo Park, Calif.

## Arktronics to Unwrap Integrated Package

LAS VEGAS — Arktronics Corp., this week here at the Comdex/Fall '83 show, will introduce Jane, an integrated software package that combines several popular business applications in one system.

According to the vendor, the software includes a word processing pro-

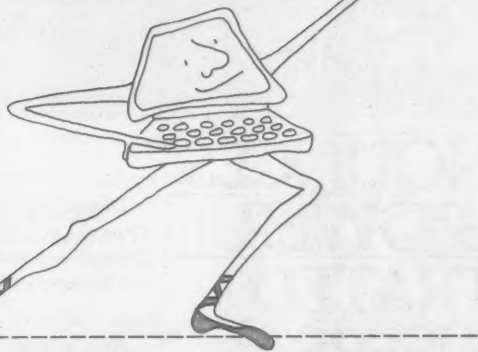
gram, spreadsheet and file/list management programs. Applications including a graphics program and a communications program compatible with MCI Communications Corp.'s electronic mail and the U.S. Postal Service's Electronic Computer-Originated Mail systems will be available in the near future.

The software is designed to operate on Apple Computer, Inc.'s Apple

II, Apple II+ (64K), the Apple IIe (including Apple's new double-resolution graphics) and a tape cartridge version for Commodore, Inc.'s Commodore 64 computer. The software requires systems containing at least 64K bytes of random-access memory.

The software package is priced at \$295. Further information can be obtained from Arktronics Corp. at 113 S. 4th Ave., Ann Arbor, Mich. 48104.

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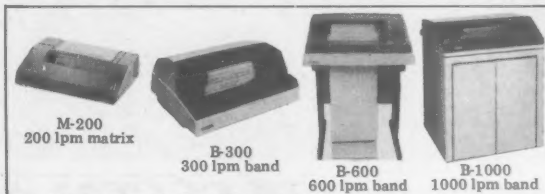


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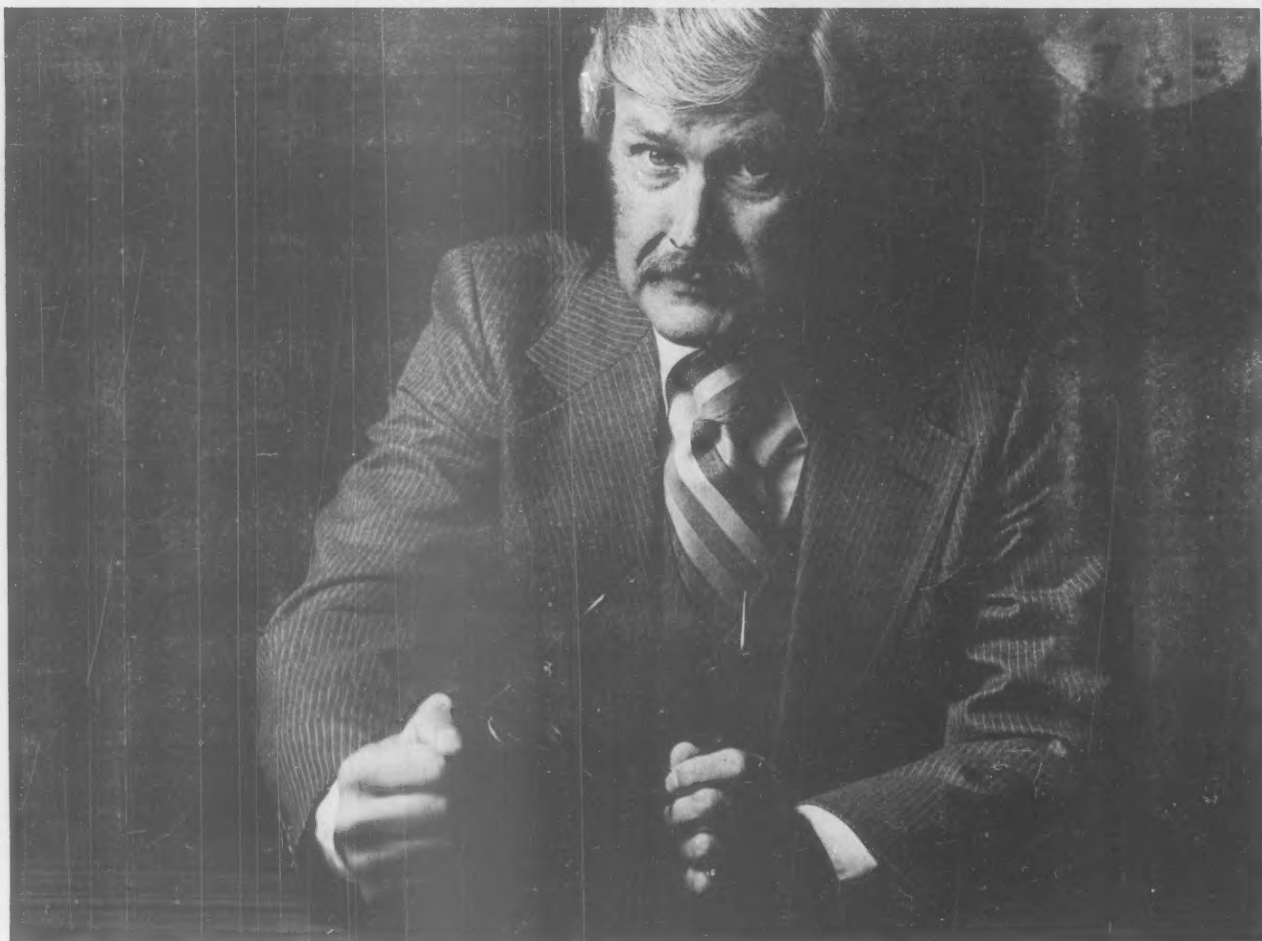
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# **PLESSEY**

## This Week at Comdex/Fall '83

## MDBS Utilities for 'Knowledge Manager' to Bow

LAS VEGAS — Micro Data Base Systems, Inc. (MDBS) will be introducing three facilities for its Knowledge Manager information management software package at Booths 390-495 here this week during Comdex/Fall '83.

Knowledge Manager reportedly integrates a relational data manager with an ad hoc query language, a third-generation spreadsheet, statistical analysis, a screen I/O manager, a printed forms manager and a full-scale programming language. The package is available under IBM's PC-DOS; Microsoft, Inc.'s MS-DOS; and Digital Research, Inc.'s CP/M 86 and MP/M 86.

MDBS will introduce a forms painter, full-screen text processor and a graphics facility.

Kpaint reportedly allows Knowledge Manager users to design I/O

forms interactively, using up to 64 foreground/background color combinations. A company spokesman said the utility enables users to receive visual feedback immediately as each characteristic of the form is electronically painted onto the console screen as it is designed. The utility can be used to design forms from scratch or to modify previously designed forms, and the forms can be used for screen I/O or printer output.

The second utility, Ktext, enables a user to enter, maintain and display any type of text within a Knowledge Manager session, the spokesman

said. The text may be various kinds of documents such as reports, letters and memos, or it could be free-form text such as package procedures, macro declarations and form declarations. Integration of the utility with the data manager and spreadsheet permits merging of text with data on a record-by-record basis.

Kgraph, the third utility, reportedly enables users to plot information held in Knowledge Manager tables, spreadsheets, arrays and variables. Plots supported include clusters, stacked and three-dimensional bar graphs, scatter diagrams,

line graphs, cumulative and percentage area plots, pie charts and free-form drawing. Up to four plots may be displayed on one screen, according to the spokesman. Plot commands reportedly can be invoked interactively or embedded in Knowledge Manager procedures.

Kpaint will be available for shipment during the present quarter for \$100. Ktext, at \$100, and Kgraph, at \$225, will be available during the first quarter of 1984. Demonstrations will be conducted by MDBS, which can be reached through P.O. Box 248, Lafayette, Ind. 47902.

Omnicdata  
To Show System

LAS VEGAS — Omnicdata will introduce a multiple microprocessor system called the Omni Convertible in Booth H-7760 here at Comdex/Fall '83. The Omni Convertible is said to feature a Variable Processor Architecture (VPA), which allows conversion from one multiple microprocessor configuration to another by means of plug-in microprocessor boards.

VPA reportedly permits the Omni Convertible to operate concurrently with up to three different microprocessors, employing such operating systems as Digital Research, Inc.'s CP/M and Microsoft, Inc.'s MS-DOS and Xenix.

Equipped with a Zilog, Inc. Z80H and a Texas Instruments, Inc. 9995 microprocessor, the Omni Convertible can be expanded to include the Intel Corp. 80186 and 80286, as well as Motorola, Inc.'s 68000, according to a spokesman.

Pricing for the Omni Convertible is scheduled to be announced at the show, the spokesman said.

Omnicdata is located at 5717 Corsa Ave., Westlake Village, Calif. 91362.

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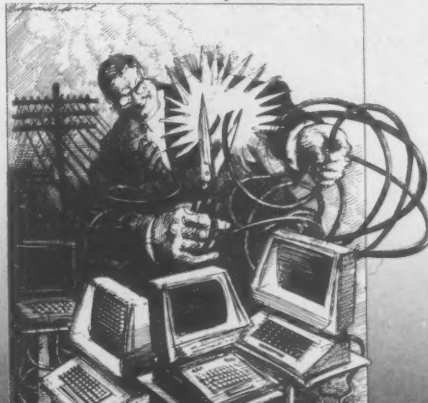
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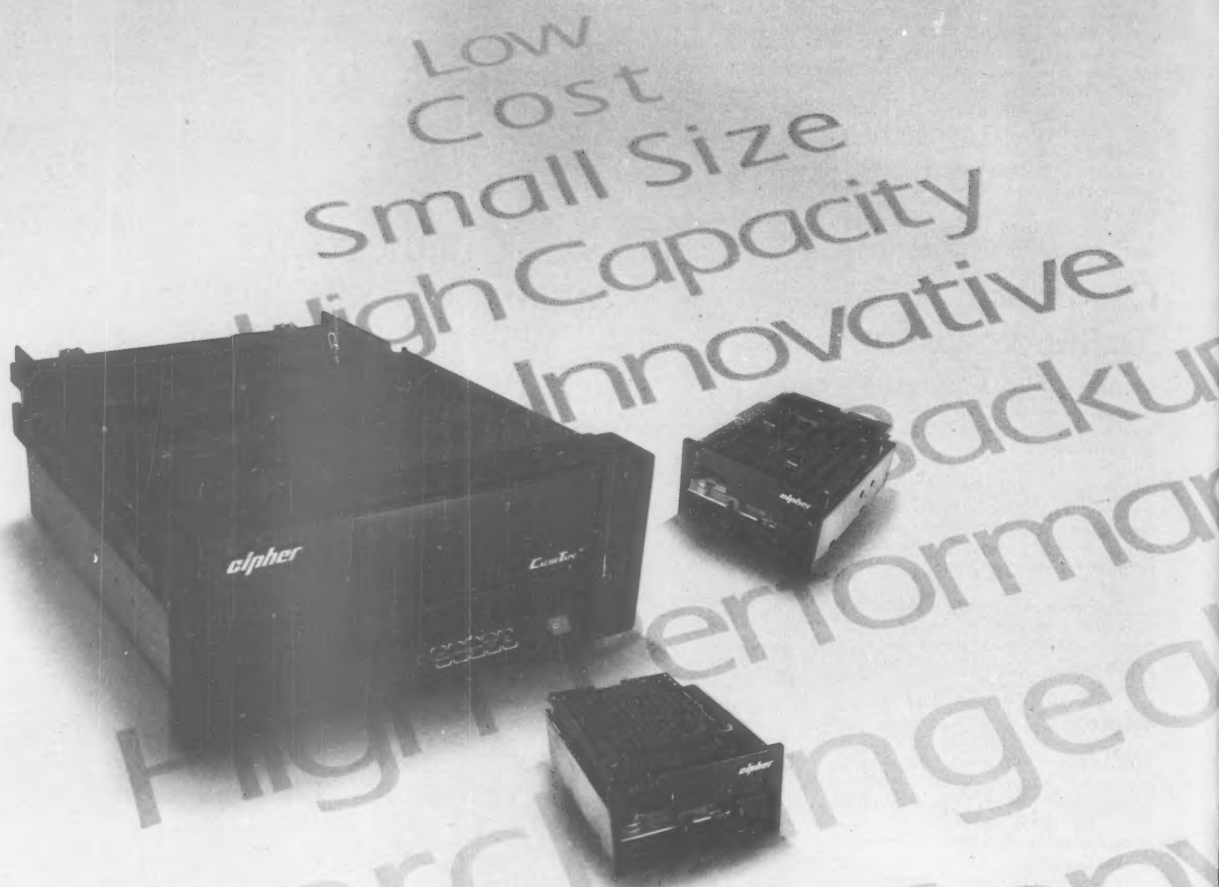
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## This Week at Comdex/Fall '83

# CYB Systems to Release Micros, Net Products

LAS VEGAS — CYB Systems, Inc. has announced plans to introduce six new microcomputer and networking products at the Comdex/Fall '83 exhibition here.

According to CYB Systems, the high-speed personal computer networking tools to be unveiled this week will provide a multiuser, multitasking, virtual terminal environment that operates under the firm's Uniplus Unix System V operating system.

The products include: the CYB/Workmate Computer professional workstation; the CYB/Unite-4I and

CYB/Unite-16I personal computer network server systems; the CYB/Workmaster software development system; the CYB-Sky floating-point processor; and the RM/COS Commercial Operating System software.

The CYB/Workmate Computer professional workstation is a desktop computer that can be used as a stand-alone micro or as a networked software development station. With networking, the system can share centrally located disks and peripherals, and in such a configuration, the system loads the operating system and executing programs directly

from the network server system.

The CYB/Workmate reportedly processes locally and offers transparent access to files, programs, electronic mail and other features residing in the network server. The system uses a 16-bit processor chip and features up to 512K bytes of high-speed memory and two serial communications ports.

It also has up to 10M bytes of hard disk storage and can function with Xerox Corp.'s Ethernet local-area network, a company spokesman explained.

The vendor said that the CYB/

Unite-4I microcomputer network system allows up to four IBM personal computer users to share Unix and Microsoft, Inc.'s MS-DOS operating system files, utilize electronic mail and share printers and large disks. The system reportedly can operate either as a local network server or be interconnected with other 4I units and CYB/Unite-16I units to form larger networks.

### Stand-Alone Micro

It reportedly can be used as a stand-alone IBM Personal Computer-compatible micro or as the central node in a network of up to three other IBM Personal Computers.

The CYB/Unite-16I micro networking system is said to enable users of the IBM Personal Computer and Personal Computer XT to utilize the multiuser, multitasking capabilities of the Unix operating system, including centralized data files, hard disk storage, printer spooling, peripheral sharing and electronic mail.

According to the vendor, the system can be used as the central node in a network of up to 16 IBM Personal Computers, Personal Computer XTs and existing CRT terminals.

The CYB/Workmaster software development system reportedly features the Motorola, Inc. Model 68010 microprocessor, enhanced with optimized instruction execution, loop mode and page faulting with instruction continuation.

Total memory is said to be increased from 1.5M to 8.5M bytes to reduce disk access requirements. Communications capabilities include two high-speed serial ports that operate at a 38.4K bit/sec transmission rate and intelligent, buffered serial controllers that function at rates from 50 to 19.2K bit/sec rates.

The CYB-Sky system, also to be introduced at Comdex, is a single floating-point processor that is designed to work with CYB computers. The processor basically delivers additional processing power for applications written in Fortran or C, a spokesman for the firm said.

Most programs reportedly will require only relinking or recompiling to work with the CYB-Sky floating-point processor.

### Cobol Applications

Finally, the RM/COS commercial operating system is said to be a multiuser, multitasking package for the development and execution of Cobol applications.

A third-generation system designed by the Ryan-McFarland Corp., RM/COS is engineered to support a specific compiler and to perform vertical applications such as general ledger and accounts payable. It reportedly features automatic file compression, record-level locking, data protection and interactive and batch command capability.

CYB Systems will announce both price and availability at the Comdex conference.

The firm's headquarters are located at Suite D-106, 6448 Highway 290E, Austin, Texas 78723.

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## This Week at Comdex/Fall '83

# Monroe to Show 80186 Chip in Its Model 2000

LAS VEGAS — Monroe Business Systems has made a change to the standard IBM Personal Computer-compatible recipe, joining several other manufacturers.

The new ingredient in its Monroe Model 2000, which will be shown at this week's

Comdex/Fall '83, is an Intel Corp. 80186 chip. By abandoning the Intel 8086 and Intel 8088, the company has come up with a "pure 16-bit system," Robert Kane, president of the firm, claimed.

Kane said the Intel 80186 chip gives the Model 2000 an

edge over other IBM Personal Computer-compatibles: "Our computer runs at 8 MHz; the actual IBM Personal Computer runs at 4.7 MHz."

Targeted at the business professional, the Monroe Model 2000 can operate most

IBM Personal Computer software, Kane said.

With the addition of a \$475 Zilog, Inc. Z80 card, which Monroe plans to sell, the system will also run 8-bit Digital Research, Inc. CP/M-based software, according to the vendor.

The firm has created both a floppy disk and hard disk version of the Monroe Model 2000.

The system has half-height, 640K-byte disk drives, internal 128K-byte memory expandable to 896K bytes and three RS-232 serial ports, Kane noted. Both Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M 86 operating systems, along with GW Basic, come bundled with the \$4,295 base model. Equipped with 10M bytes of hard disk, the system costs \$5,600.

The Monroe 2000 will be shipped in January. At the same time, the firm will reportedly introduce a synchronous 300 to 1,200 bit/sec modem, a letter-quality printer and a dot matrix printer for the system.

Monroe is located at The American Road, Morris Plains, N.J. 07950.

## ADC to Introduce S-100 Single-Board Micro

LAS VEGAS — Advanced Digital Corp. (ADC) will introduce its Super 186, an S-100 single-board computer built around Intel Corp.'s new 16-bit 80186 semicon-

ductor chip, at the Comdex/Fall '83 show.

The 8 MHz Super 186 reportedly can be configured as a stand-alone bus master or bus slave to serve both

single or multiple users. It can be used to enhance the performance of ADC's Super Slave processor boards or as an 8-bit slave card to process exceptionally large workloads at increased speed, according to the vendor.

Super 186 is said to feature 256K bytes of memory, expandable to 1M byte; a floppy disk drive controller that can simultaneously support both 5¼-in and 8-in. disk drives; four serial RS-232 and two parallel I/O ports; a di-

rect-memory access controller; and parity and monitor erasable programmable read-only memory.

The board is said to be compatible with Digital Research, Inc.'s CP/M 86 and MP/M 86; Software 2000, Inc.'s Turbodos; and Microsoft, Inc.'s MS-DOS operating systems.

Super 186 has a suggested retail price of \$1,650. ADC is located at 5432 Production Drive, Huntington Beach, Calif. 92649.

## Ovation to Feature Software

LAS VEGAS — Ovation Technologies will introduce its Ovation Software and its Common Command Environment at Booth 117 here at the Comdex/Fall '83 conference.

During the show, the company will also host the Association of Better Computer Dealers' annual Comdex business meeting on Monday, Nov. 28 at Caesar's Palace here. At that meeting, Ovation President Thomas Gregory will give the keynote speech on "Management in a High-Growth Industry."

Ovation software, former-

ly introduced in mid-October, reportedly allows businessmen to use personal computers to analyze data, create reports, file information, construct graphs and communicate with other computers. The program can reportedly be operated with less than 30 commands. Features include virtual memory, context-sensitive Help, user prompts, micro capabilities and automatic backup.

Priced at \$795, it will be available during the first quarter of 1984. Ovation Technologies is located at 770 Dedham St., Canton, Mass. 02021.

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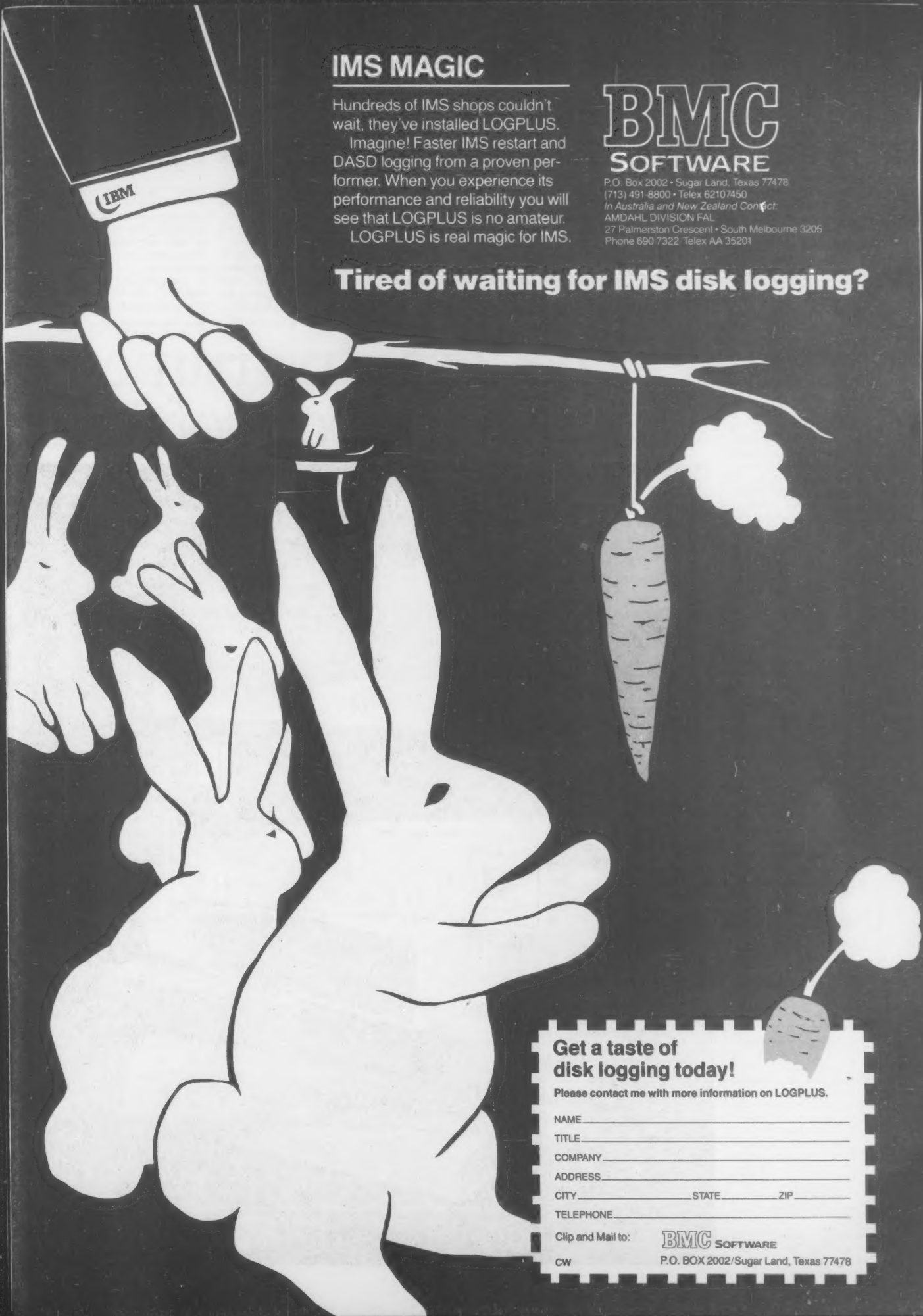
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## This Week at Comdex/Fall '83

# Dynasty Local Net to Bow From Dy-4 Systems

LAS VEGAS — Dy-4 Systems, Inc. will be demonstrating components of its Dynasty local-area network software at the Comdex/Fall '83 show this week, said to allow workstations with different operating systems to be configured into the same network.

The Dynasty 3.0 local-area

network reportedly can accommodate workstations with 8-, 16- and 32-bit boards and allow communication and storage among Digital Research, Inc.'s CP/M 2.2; Microsoft, Inc.'s MS-DOS 8088; and the Unix operating systems.

The Dynasty local-area

network will support up to 64 microcomputers and printers incorporated with a central file server capable of storing up to 40M characters, a spokesman said.

A variety of disk technologies can also be incorporated into the network, including the company's Ramdisk

module, a dense memory card that reportedly provides semiconductor random-access memory emulation of a floppy disk system.

Dy-4 Systems is a four-year-old Canadian company that plans to double sales next year, partly through expansion into the U.S. and Eu-

rope. It plans a major push abroad with its Dynasty integrated computer system and a product line that eventually will encompass 32 products based on its VME bus boards.

The company is located at 888 Lady Ellen Place, Ottawa, Ont. Canada K1Z 5M1.

## Firm to Offer Office Tool Under CP/M

LAS VEGAS — Molecular Computer, Inc., in Booths 316 and 417, will demonstrate its Application Tool for Office Management (Atom) integrated office management software package here at the Comdex/Fall '83 exhibition. The package is compatible with multiuser computers running under Digital Research, Inc.'s CP/M operating system.

Atom consists of an electronic spreadsheet, electronic mail package and a word processing package. All of the packages are said to function together as a unit and share a comprehensive set of menus, Help facilities and system manager functions.

Atom is designed to allow other standard packages supplied by outside vendors to be easily integrated into the system by its automatic installation function, according to a vendor spokesman.

Atom is list priced at \$1,400. Molecular Computer is located at 251 River Oaks Pkwy., San Jose, Calif. 95134.

## Micro Prize Offered

LAS VEGAS — The Naked Mini Division of Computer Automation, Inc. is planning to give away a microcomputer system based on the Unix operating system to the person who can correctly identify the name of Computer Automation's version of Unix.

The winner will receive the firm's Datacase/5 microcomputer with 512K bytes of random-access memory and one parallel and seven serial ports. Also included with the system is a 1.6M-byte, unformatted low-profile floppy disk drive and a 12.7M-byte Winchester disk drive. The unit costs \$13,000, the vendor said.

Computer Automation is based at 18651 Von Karman, Irvine, Calif. 92713.

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These best-sellers are among the most popular business software programs for microcomputers as reported in Inc. magazine, September, 1983.



## This Week at Comdex/Fall '83

# Pyramid to Show Unix-Based, 32-Bit Supermini

LAS VEGAS — Pyramid Technology Corp. will demonstrate at Comdex/Fall '83 here this week its 32-bit, virtual memory superminicomputer that is based on the Unix operating system and reportedly can host from 16 to 128 Unix-based microcomputers operating in business

environments.

The recently announced Pyramid 90X features a proprietary 32-bit CPU that reportedly has a 125-nsec cycle time and 4K-byte, high-speed instruction cache. Physical memory space in the unit can range from 1M to 8M bytes. In addition, the

memory hierarchy is said to provide each Unix process with 4G bytes of virtual address space, utilizing a 2K-byte page size for demand paging.

The system features a synchronous Xtend bus, which has a 32M byte/sec transmission rate and reportedly a

flexible, open-ended design that will allow future multi-processor configurations and integration of new technology. The bus can support the CPU, one to four memory modules, the system support processor, multiple I/O processors and adapters leading to other buses, according to a

company spokesman.

Enhancements to the Unix System V include streamlined system calls and trap recovery, a 2K-byte block size for the file system and I/O logic offloading. Pascal, C, and Fortran 77 compilers reportedly generate code optimized for a register-intensive architecture.

System prices range from \$100,000 to more than \$300,000. The company is located at 1295 Charleston Road, Mountain View, Calif. 94043.

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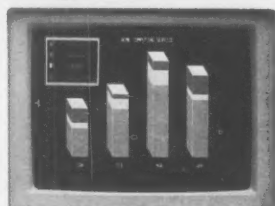
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## CIE to Offer Medical Tool

LAS VEGAS — CIE Systems, Inc. will introduce the MED/680 medical practice management package this week at Comdex/Fall '83.

The MED/680 package is said to be a totally integrated system that allows for immediate patient information update and reporting and for the linking of treatment and procedural information to an accounts receivable and third-party billing system. It is reportedly compatible with all the company's Model 680 desktop computers.

The MED/680 has a text-processing feature that allows for the generation of insurance claims, patient recall notices, appointment reminders, account dunning notices and billing statements, a spokesman said.

Further, the package features accounting tools such as daily activity reports (by physician or for the entire practice), insurance carrier accounts receivable, responsible party accounts receivable and cash flow analysis, according to the spokesman.

The MED/680 package is priced at \$2,800 through CIE Systems, 2515 McCabe Way, P.O. Box 16579, Irvine, Calif. 92713.

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## This Week at Comdex Seagate to Unwrap Disk Products

LAS VEGAS — Seagate Technology, Inc. will be in Booth 4324 at Comdex/Fall '83 demonstrating its 12M-byte, half-height ST212 and 25M-byte, full-height ST425 disk drives as well as its ST9000 controller and the ST400 family of 6M-, 12M- and 19M-byte standard-height drives.

The ST212 is a 5 1/4-in. Winchester disk drive that has a single platter and four mini-slider read/write heads. It costs \$1,265. The ST425 is a 5 1/4-in. drive that has a two-disk, eight-head design. It sells for \$1,645. Both products have an average access time of 65 msec. The ST400 family of 5 1/4-

in. Winchester disk drives includes the 6M-byte, single-platter, two-head ST406, priced at \$965; the 12M-byte, dual-platter, four-head ST412, priced at \$1,215; and the six-platter, three-head ST419, priced at \$1,465. The drives have average access times of 85 msec and operate at 345 track/in.

The ST9000 is an intelligent controller designed to provide an interface for up to two 5 1/4-in. Winchester disk drives to a host processor. It costs \$255.

Seagate is located at 920 Disc Drive, Scotts Valley, Calif. 95066.

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## Tool to Aid Windowing

LAS VEGAS — Structured Systems Group, Inc. will introduce its Windowmaster software this week at Booth 2124 here at the Comdex/Fall '83 show.

The product is a windowing package that allows users of IBM Personal Computers and Personal Computer XT microcomputers to perform a number of computing jobs simultaneously. The Windowmaster allows users to open, close, expand, reduce or move windows on a CRT screen. In addition, users can reportedly switch from one task to another.

The package costs \$495, the vendor said.

Along with Windowmaster, the vendor will also be showing its entire line of micro software, including the Word Right word processing package. Structured Systems Group is located at 5204 Claremont Ave., Oakland, Calif. 94618.

## Century Data To Offer Winnie

LAS VEGAS — Century Data Systems, Inc. will announce a high-speed Winchester disk drive this week here at Comdex/Fall '83.

The average access time of the AMS 571 drive is 19 msec, and the unit's data transfer rate is 19.2K byte/sec, the vendor said. The disk reportedly accomplishes this by combining 32,000 byte/track with a five-disk platter configuration. The product also utilizes 19 thin-film heads.

The AMS 571 costs \$13,500 and includes the basic drive, power supply, desktop enclosure and all interfaces.

Further information is available from Century Data Systems, 1270 N. Kraemer Blvd., Anaheim, Calif. 92806.



## This Week at Comdex/Fall '83

# Rosscomp to Unveil Tape Subsystem, Drive

LAS VEGAS — Rosscomp Corp. will announce its Series 70 tape drive subsystem and D5160 ½-in. streaming tape drive at Comdex/Fall '83 here later this week.

According to the vendor, the Series 70 handles up to 160M bytes of storage and supports several industry-standard interfaces. The system is available either in portable desktop or rack-mountable versions. The subsystem unit may be configured with either one or two of the company's Series 80 (Model D160-90) ½-in., 160M-byte

streaming tape drives and includes its own self-contained power supply and cooling system.

Single-unit OEM pricing for the desktop Series 70 with one Series 80 drive is \$2,995; the price for the two-drive version is \$3,695. Single-unit pricing for the rack-

mounted, single-drive subsystem is \$2,895; the price for the two-drive version is \$3,595.

The D5160 ½-in. tape drive provides 160K bytes of backup in less than 20 minutes, according to the vendor.

The product also supports

either 90 or 130 in./sec tape speeds allowing transfer rates of 90K or 130K bytes, respectively. The D5160 can

be configured with one of three single-board subsystem controllers, which facilitate communications between a host processor with a Sasi interface and disk drives

with either the Q2000, SA1000 or Storage Module Drive interfaces, the vendor said.

Price will be announced at the show, and further information is available from Rosscomp, 16643 Valley View Ave., Cerritos, Calif. 90701.

## Xcomp To Show Disk Drives For Micros

LAS VEGAS — Xcomp, Inc. will be exhibiting its line of microcomputer disk drives here this week at the Comdex/Fall '83 show.

On display will be the XF-30, which offers a format capacity of 31M bytes and features a voice coil head positioner. This, the vendor said, gives the unit full stroke seek times across 640 cylinders at 80 msec.

Also on display will be the XF-20, which features the same position technology as the XF-30 with a formatted capacity of 21M bytes, the vendor said.

The units are supported for the IBM Personal Computer using IBM's PC-DOS Release 2.0 operating system. They can also be used on other microcomputers using Digital Research, Inc.'s CP/M operating system. The XF-30 costs \$3,995, and the XF-20 costs \$3,395, the vendor said.

The vendor will also be showing its Toaster, a dual 5M-byte hard disk cartridge subsystem. The unit features two independent disk drives, each of which accepts a removable 5M-byte hard disk cartridge. The cartridges can be independently removed while the host processor system is operating. This, the vendor said, allows unlimited hard disk capacity.

The Toaster is supported on the IBM Personal Computer under Release 2.0 of PC-DOS. It can also be used on Apple Computer, Inc. Apple II and Apple III processors and processors using the CP/M operating system.

More information is available from Xcomp at 3554 Ruffin Road S., San Diego, Calif. 92123.

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# What Makes for Unfair Promotion?

**Q** Several of my associates and I feel we are victims of reverse discrimination. One of our peers, a woman, was promoted to project manager ahead of us and in much less time than is usual.

None of us has anything against this woman; as a matter of fact, she is well liked and respected. However, we feel she was promoted prematurely, ahead of others with greater experience.

In our opinion, she was promoted unjustly so that management could point to at least one female manager in the management information systems (MIS) department. Should we express our concerns to management and/or take legal action?

**A** Perhaps you are a victim of reverse discrimination, or perhaps you have allowed your egos to get in the way of good judgment. We all tend to exalt our accomplishments and inflate their impact on the organization.

With the number of female MIS professionals approaching that of males, the MIS department is the last place one would expect an incident of reverse discrimination. I often find the top-ranking woman in a corporation to be associated with the information services function. To be sure, we have a long way to go before women achieve well-serving parity in MIS, but reverse discrimination is not the answer.

If this woman was promoted un-

justly, I doubt that the decision was made by the people doing the promoting, but rather by people at a much higher level. If this is the case, management has probably done its homework and will be prepared to counter successfully any legal recourse.

If the promotion criteria had nothing to do with mainstreaming women into management positions, I would imagine the most qualified person got the job. In either case, my recommendation is to do nothing, for nothing is to be gained.

**Q** I'm one of two data processing instructors in the business school at a four-year college. At present, we only offer

## Turnaround Time By Larry E. Long

four support courses in DP. Recently, we received funding for two more instructors, and the dean has asked us to look into what it would take to offer a degree program.

We are considering adoption of the Data Processing Management Association's (DPMA) Model Curriculum for Computer Information Systems. How widespread is its acceptance? Do you feel that the curriculum provides an integrated and complete coverage of DP-related topics? If not, how would you recommend it be changed?

**A** More people are seeking information systems degrees than ever before, but there is little or no uniformity between curricula. Traditionally, information systems courses have evolved because of the availability and content of a particular book or a professor's special interest. Few, if any, are based on a coordinated plan for information systems education.

The DPMA model curriculum is one alternative; the Association for Computing Machinery curriculum is another.

Currently, over 150 colleges and universities in the U.S. and Canada are in various stages of adopting the DPMA model curriculum. The DPMA curriculum is designed to prepare students for employment as business applications programmer/analysts. Its developers make a distinction between programs in business data processing, management information systems and computer information systems. I submit that the distinction is a question of semantic interpretation.

The DPMA curriculum provides a good starting point, but I would not recommend its adoption as is. It is replete with redundancies, inconsistencies and ambiguities. I would recommend that you address these shortcomings and add courses to the existing required list that will provide the student with a functional knowledge of data communications, data base management systems, office automation, systems software and state-of-the-art hardware.

I want to encourage the DPMA Education Foundation to continue to provide universities with a leg up on curriculum development. The DPMA model curriculum would best serve the academic community if the course structure and the selected references were updated annually during these formative years.

Anyone interested in further details can contact the DPMA's Education Foundation at 505 Busse Highway, Park Ridge, Ill. 60068.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.



## Is your most productive asset all washed-out?

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Glare/Guard's durable, laminated-glass design lasts indefinitely. It quickly retrofits to virtually every leading display terminal—no tools required. Its smooth surface is easily cleaned. And Glare/Guard sells for \$99, regardless of display size.

Of course, there are less expensive anti-glare products available. But the nylon strands of mesh screens cause fuzzy images. While etched panels merely spread glare around and blur resolution.

Only Glare/Guard does exactly what an anti-glare panel is supposed to do. And that's getting your terminal user's attention out of the glare, and back onto the screen.

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The 8010 professional workstation has always been known as a computer of dazzling capabilities, especially in its graphics, information processing and document preparation.

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But what some people may not know is that the 8010 is also the key element in Team Xerox, a system of office machines designed to work together like a team.

When part of an Ethernet network, the 8010 can work with a wide array of word processors, mainframes, personal and business computers, printers, electronic mail and file services, facsimile terminals, communicating Memorywriters, other networks and, of course, other 8010s. It also provides 3270 and TTY emulation.

Its full 17" bit-mapped screen lets you view two full pages simultaneously and open up to six documents at a time without covering up a previous document.

It's also the only workstation that can create and print documents in more than a dozen languages, including Russian and, for the first time, Japanese (Katakana, Hiragana and Kanji).

While other workstations may use Xerox innovations like the mouse, icons, windows, property sheets and combined text and graphics, the 8010 simply does more with them.

For example, the 8010's extensive software is fully integrated, to allow you to work with text and graphics simultaneously. You can draw a flowchart right in the middle of a full page of text without

having to resort to a separate program and limited buffer "scratchpad" or "clipboard."

In terms of capabilities, ease of use and overall value, the 8010 would have to be considered the stellar workstation in the industry.

For more information, call 800-527-1922 (in Texas, 800-442-0152), or send in the coupon. Or ask anyone who's ever used the 8010.

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## Optical Storage for Micros Will Upgrade Info Retrieval NCR Chief Tells Conference

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — Huge increases in personal computer horsepower and the expected emergence of low-cost optical disk systems will "startlingly improve the state of the art in information retrieval," NCR Corp. Vice-President Donald Coleman said here recently.

During a Nov. 14 presentation at the annual International Information Management Congress, Coleman predicted the imminent introduction of optical disk systems costing less

than \$1,000 each.

Expected to arrive on the scene by the end of next year, the products will typically store 100M bytes of alphanumeric data or "billions" of pixels of video information, Coleman said.

Such a storage capacity will translate into 50,000 screen images or a half-hour video presentation, including sound, and will dwarf the capabilities of any personal computer disk system now on the market, he claimed.

### Natural Partners

The optical disk modules' low prices coupled with their unprecedented storage capacities will make the products natural partners of today's rapidly improving personal computers, Coleman said.

Coleman, who heads NCR's data entry systems operation, expects the future union of personal computer systems and optical disk units to have a "significant" impact on the business world in general and information retrieval technology in particular.

Potential applications for personal computer systems configured with optical disk modules might include vocational training, reference data collection and storage of product maintenance information, Coleman said.

In addition to their superior storage capacities, optical disk systems are expected to offer at least one other significant advantage over their magnetic recording counterparts: the ability to store multiple forms of information — including alphanumeric, graphics, video and sound — on the same platter, Coleman said.

### Not Without Trade-Offs

But for all their expected benefits, low-end optical disk systems will by no means be without their trade-offs. Compared with old standby technologies like computer output microfilm, for example, optical units are less portable, have longer turn-around times and require more expensive viewing devices, Coleman said.

Another drawback with optical storage systems is that, at least in the beginning, the products will be capable only of reading data, not of writing it — a shortcoming that will temporarily "limit their usability," Coleman added. A read/write feature is unlikely to be added to low-end optical disk systems until the mid-1980s.

The anticipated marriage of personal computers and optical storage units will coincide with three other "technology-driven" trends, all of which will also contribute to the advancement of information retrieval capabilities, Coleman said.

The three trends are the advent of improved information retrieval software, an explosion in the number of installed personal computers and rapid growth in the processing power of individual workstations.

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It is from the same company who standardized the minifloppy with Shugart and the 5.25" Winchester drive with Seagate.

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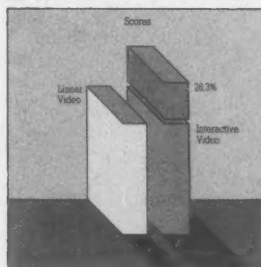
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Robert E. Herlihy

ROBERT E. HERLIHY has been appointed senior vice-president for W.R. Grace &

Co. in New York. He heads Grace's Computer Technology and Operations Division.

Prior to joining Grace in 1968 as director of management science, Herlihy was with the General Electric Corp. for 10 years. He was named corporate vice-president at Grace in 1978.

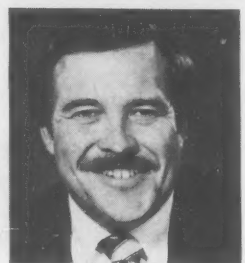
Herlihy received a B.S. degree in civil engineering from Tufts University in

1953. He pursued graduate studies in mathematics and operations research at Cornell University. He also attended U.S. Naval Officer's Candidate School in 1954 and is a former lieutenant commander in the U.S. Naval Reserve.

JOHN B. CAMERON has been promoted to systems manager of information services for Delta Air Lines in

Atlanta. Cameron served as manager of information services since 1981.

A 14-year Delta veteran, Cameron joined the airline as a ramp service agent in Memphis. He became an associate programmer in 1975 and was promoted to programmer the following year. In accordance with the airline's promote-from-within policy, he continued to be promoted to positions of in-

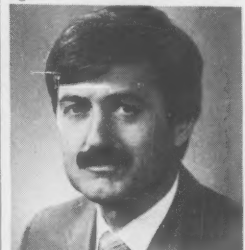


John Cameron

creasing responsibility in Delta's Information Service Department.

Cameron attended Memphis State University.

STEPHEN D. TRISKO has been named director of management information ser-



Stephen D. Trisko

vices for Panduit Corp in Oak Brook, Ill. Trisko will be responsible for the development and implementation of all corporate MIS systems, as well as a significant upgrading of Panduit's hardware configuration.

Before joining the manufacturer of wiring duct and cable ties, Trisko previously was manager of MIS for Siemens Gammasonics, Inc.

Trisko holds a B.S. degree in computer sciences from Roosevelt University and an MBA from Northwestern University.

DONALD L. KIDD has been appointed director of information management for Morton Thiokol, Inc. in Chicago, where he will be responsible for the management information services functions in the corporate office. He will also share the responsibility for providing direction to all the management information systems and office systems activities through out the corporation.

Kidd joined Morton Thiokol in 1978 after working for U.S. Steel Corp. He graduated from the University of Pittsburgh in 1961 with a B.A. in industrial management.

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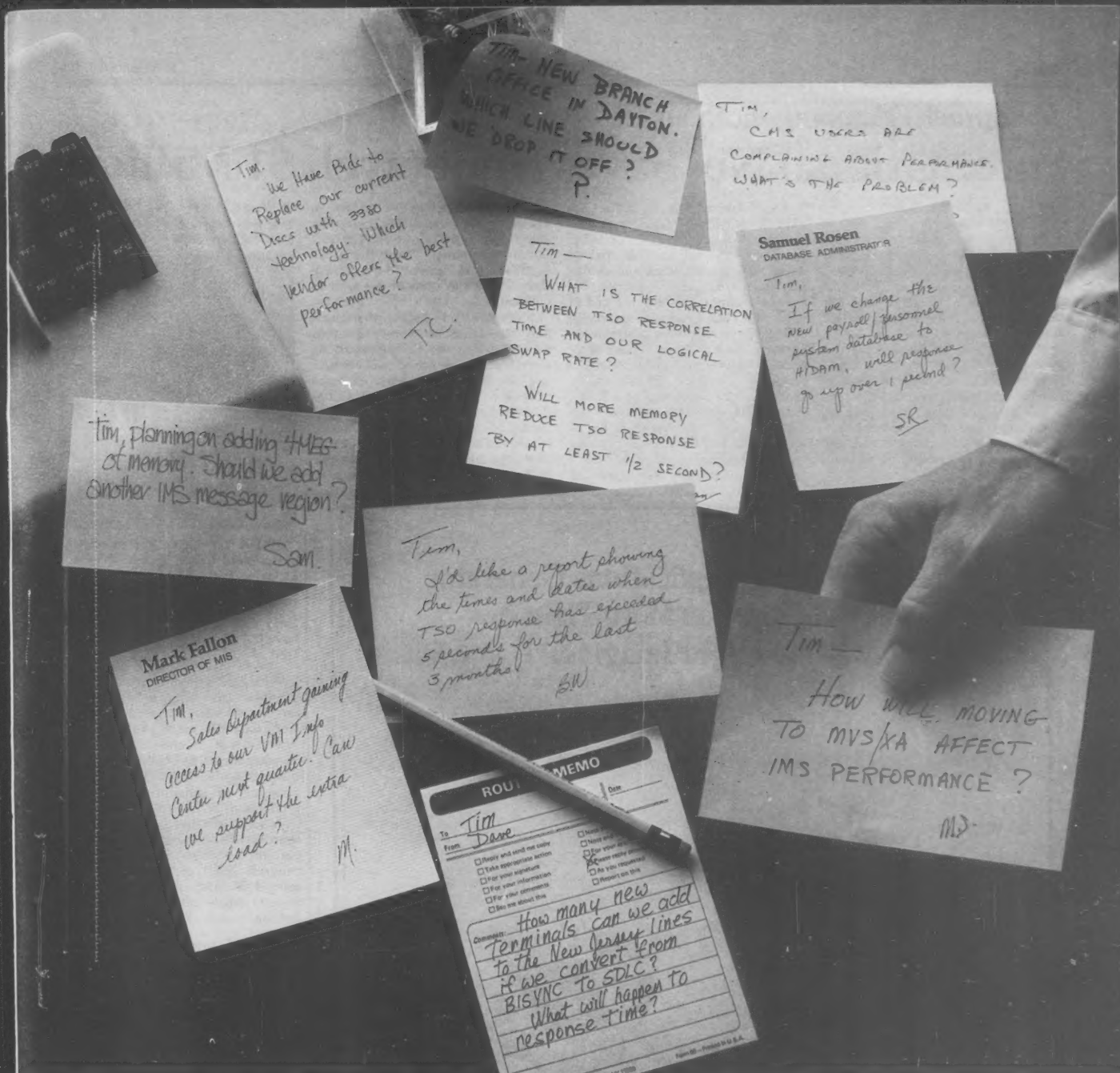
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
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## In Annual Telecommunications Costs International Net Saves Honeywell \$1 Million

By Robert Batt

CW West Coast Bureau

PHOENIX — On an average day, the computer network at Honeywell, Inc.'s Large Computer Products Division transports more than 8.5 billion char./hour among 61 large- and 150 small-scale computer systems to six different countries.

With \$6 million needed just to cover the annual telecommunications bill for the division's 4,000 employees, the Honeywell facility here began taking a long, hard look at how to cut costs. The results of that effort, company officials claimed, are savings of approximately \$1 million each year.

When the cost-cutting project began, Gerry Bedore, manager of telecommunications for the division, considered five alternatives: dial-up networks; concentration and multiplexing ports; private branch exchange technologies for integrated voice and data; local-area networks; and Honeywell's own Distributed Systems Architecture (DSA) software. DSA was eventually selected, Bedore said, because of its capability to access immediately multiple hosts, concentrate data into packets and support multiple networks in Canada, the UK, France, Germany, Japan and Australia.

"My No. 1 priority was to control

costs. Our charge was to cut down on operating expenses while increasing the productivity of our employees," Bedore explained. "Everything we used was stock right off the shelf. We didn't have the time or the staff to customize."

Honeywell's locations in Arizona and Massachusetts were connected via GTE Telenet Communications Corp.'s packet-switched network and to a Canadian location via a combination of GTE Telenet and Bell Canada's Datapac packet-switched network. Transatlantic service connected the network to public service networks in Europe — Transpac in France, PSS in the UK and Datex-P

in West Germany. The DSA installation now supports a total of 18 international networks.



"My No. 1 priority was to control costs," said Gerry Bedore, manager of telecommunications for Honeywell's Large Computer Products Division. "Everything we used was stock right off the shelf. We didn't have the time or the staff to customize."

With DSA software creating a distributed processing network, data can be stored, processed, accessed and exchanged among various Honeywell divisions and functions, Bedore explained. In Phoenix, the manufacturing facility can obtain inventory information and develop production schedules, while software engineers have access to many centralized data bases. The system reportedly enables communications between small computers, satellite computers and large-scale mainframe systems and is supported by just four people.

### File Transfer Capability

Bedore said the file transfer capability of the network has become an important and valuable facility for saving resources and increasing productivity. Prior to the installation of DSA, data and program files were moved by hand between systems. Today, almost all files from Honeywell's DPS 6 small systems and DPS 8 large-scale computers are electronically transferred across the network.

Currently, the Honeywell manager estimates that his division is about one-third of the way toward fulfilling its long-range plan. Around 950 of the 3,500 terminal devices at the Phoenix locations are connected directly into the network. The measurement of 8.5 billion char./hour, he said, represents only 42% of the total capacity of the network.

A side benefit of the new system, Honeywell claimed, is that now the division can serve as a test site for newly developed DSA products. Currently, Bedore's organization is evaluating a new release of satellite software. Future plans include a pilot project for Honeywell's Office Automation System software releases and an intersystem electronic mail pilot.

With the advent of new Honeywell microprocessors, an interface for downline loading of terminals is also reportedly being planned for the division's network.

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## Marine Firm Deep-Sixes Production Woes With Utility

WAUKEGAN, Ill. — The DP department at Outboard Marine Corp. here began searching three years ago for ways to improve both programmer productivity and turnaround time, scanning various interactive programming tools in the process.

Up to that time, programmers at the outboard motor maker developed programs using batch processing, submitting card decks and waiting for output. Paul Becker, systems programmer, began looking for utilities that allowed IBM's TSO functions to run on his shop's Amdahl Corp. 470V/6-II mainframe, "but without TSO's constraints, such as its overhead and single line editor," he said.

Becker tried one product on a 30-day free trial, but it did not support IBM's Tcam. Using it would have required creating and using an operating system with IBM's Vtam. When Becker tested that operating system on the product, documentation on creating user-defined commands was inadequate and the product did not have easy-to-use screen layouts.

At an early stage in his investigation, Becker obtained some product descriptions and manuals from AAI Systems, Inc. of San Ramon, Calif., which sells Acep. "We knew TSO, so we knew what the commands looked like," Becker said. "When we saw the Acep commands, they looked very much like TSO commands, which impressed us."

Another consideration was that Acep was capable of doing a general poll of each IBM 3270 terminal controller attached to the Amdahl system, unlike TSO, which required polling each individual terminal attached to the controller. Given the size of the department's teleprocessing network, this meant Acep would impose less overhead on the system.

Acep allowed programmers to do on-line editing of source modules, submit jobs in batch mode and look at batch job output on-line. "That alone accomplished 90% of our original goals," Becker recalled, and provided paper savings he termed "enormous," since intermediate compiles and tests did not have to be printed.

Another feature that impressed the outboard motor company's programmers was Acep's split-screen edit abilities, allowing each programmer to display on one part of the CRT screen any error messages from a compilation and the listing itself on another part.

One unanticipated benefit of Acep was a "poor man's word processing system" made possible by the full screen editor, Becker noted. The DP department has since purchased word processing software intended specifically for that task (Applied Data Resources, Inc.'s On-Line ETC), although an extension of the word processing capabilities gave the department a source data entry system that is still in use.

Another extension of this idea introduced electronic mail to Outboard Marine. With 11 operations in three states and Canada, it sometimes took a day for intracompany mail to travel between locations. However, the company already had several termi-

nals and printers in each location linked to Waukegan, Ill.

Acep allowed users to create text files with nonconfidential messages; a menu in the electronic mail port of Acep allowed users to route the message to the printer located closest to the intended recipient. The messages are now sent instantly to those terminals, where they are printed and distributed.

The department's system, now anchored by an Amdahl 5860 mainframe, services 40 programmers and others at company headquarters here, as well as operations in 40 other locations. A network of 450 terminals runs under CICS/VS.

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# ACM and Its Education Group to Host Meets

NEW YORK — The Association for Computing Machinery's (ACM) 12th annual Computer Science Conference will be held Feb. 14-16 at the Franklin Plaza Hotel in Philadelphia.

Also scheduled at the hotel is the ACM Special Interest Group on Computer Science Education's (ACM/SIGCSE) 15th Technical Symposium on Computer Science Education, which will be held Feb. 16-17.

The first conference's technical focus is on three theme days titled "The Factory of the Future," "Coping with Small Computers" and "Social and Ethical Implications of Computers." Also, a panel session on the impact of Ada has been scheduled for Feb. 16.

Complementing the technical program will be an exhibit highlighting the latest products and services in the computing field. The conference luncheon will feature the ACM Doctoral Dissertation Award and awards to top finishers in the ACM International Scholastic Programming Contest. The contest will be held the evening of Feb. 15; also that evening, a film will be shown of early computers in action.

For members, registration for the full ACM Computer Science Conference costs \$55, and one-day registration is \$40. Nonmember fees are \$90 for the full meet and \$55 for one day. The cost for department chairmen is \$80. On-site registrations and those received after Jan. 25 will cost an ex-

tra \$20. The conference luncheon, which costs \$18 per person, is not included in the above fees. ACM is located at 11 W. 42d St., New York, N.Y. 10036.

The ACM/SIGCSE Symposium will include "paper" sessions on teaching service courses, computer literacy, computer science projects, methods and approaches to teaching various subjects and faculty development. Special sessions will include computer science education in small colleges and in liberal arts colleges, accreditation of computer science programs, status of women in computer science and the role of mathematics in computer science education.

SIGCSE and the Computer Science

Conference will sponsor joint sessions on social and ethical implications of computers, slated for Feb. 16.

Registration fees are \$45 for ACM/SIGCSE members, \$50 for nonmembers, \$10 for students and \$18 for the conference luncheon. More information about the Symposium is available from General Chairman Richard H. Austin, Department of Computer Science, University of Maryland, College Park, Md. 20742.

## Simulation Meet Scheduled For April 18-20

NORFOLK, Va. — The Society for Computer Simulation is sponsoring the Simulators Conference, scheduled to take place here April 18-20.

The conference will touch on human factors engineering in simulator design; methods for solution of equation systems; development of simulator software; terminology, standards and regulations; simulation of operator environment; simulator computer system architecture; discrete system simulators; as well as training curricula, facilities and organizations.

Sessions of specific simulator applications will cover topics including power generation plants; aircraft; maritime; biomedical; processes; ground vehicles; and various research and development simulators, according to the sponsor.

Registration is \$175 for the event. Further details are available from Charles Pratt, Executive Director, Society for Computer Simulation, P.O. Box 2228, La Jolla, Calif. 92038.

## DP Acronym Book Out for Auditors

FRAMINGHAM, Mass. — MIS Training Institute, Inc. has published the "EDP Auditors' Acronym Dictionary," which contains definitions of hundreds of computer acronyms for DP and internal auditors.

The publisher said the 40-page, vest-pocket reference guide, which offers concise explanations of more than 300 acronyms, is designed to help auditing professionals unscramble the mystery of computer jargon.

The "EDP Auditors' Acronym Dictionary" is available for \$5 plus \$1 postage and handling from MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

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## For 'Wide-Ranging Participation' Hopper Receives ACM's '83 Award

NEW YORK — Commodore Grace Murray Hopper, U.S.N.R., is the recipient of the 1983 Association for Computing Machinery's (ACM) Distinguished Service Award. The award, which is bestowed by the association in recognition of long-term service to the computing community, was presented here last month during the 1983 ACM Annual Conference.

Hopper was cited by the ACM for her "wide-ranging, unstinting participation in the computing industry and its software technology, in government and in the promotion of the profession."

After graduating from Vassar College, Hopper earned her M.A. and Ph.D. at Yale University. In 1943, as a member of the U.S. Naval Reserve, she was commissioned lieutenant and assigned to the Bureau of Ordnances Project at Harvard University, where she programmed the first large-scale computer, the Mark I.

Currently, she is serving on active duty on the staff of the commander, Naval Automation Control. Hopper has published more than 50 papers on computer programming and received the first Data Processing Management Association's Computer Sciences "Man of the Year" Award, as well as the

Harry Goode Memorial Award.

Also honored at the recent ACM meeting were Dr. Seymour Wolfson and Dr. Richard Austing, who were each presented with ACM Outstanding Contribution Awards.

Dr. Wolfson, chairman of the ACM Conference and Symposia Committee since

1977, was cited for his leadership and dedication to the organization. He is an associate professor of computer science at Wayne State University in Detroit.

The award was also presented to Dr. Austing for his major contributions to the organization in the area of computing education. As a member of the ACM Educa-

tion Board since 1970, Dr. Austing has taken a leading role in the formulation of three ACM recommended curricula, including the two-year Associate Degree Computer Programming Curriculum and the Doctoral Program in Health Care Computing. He is presently a faculty member at the University of Maryland.



CW File Photo

Grace M. Hopper

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## Deltak Offers Training Series On Vsam Issues

NAPERVILLE, Ill. — "Keeping Current" is the name of a newly released multimedia training series produced by Amdahl Corp. and available from Deltak, Inc.

The program presents technical information on Vsam performance considerations; IBM/VS performance through selected releases and features; planning, upgrading and maintaining IBM's ACF/Vtam-ACF/NCP network; cost-benefit perspectives on new MVS/SP1.3 features; and planning and implementing JES2 under MVS/SP1.3 storage management.

Each segment features a video and text that together require between one and three hours to complete, according to Deltak.

The course can be purchased for \$1,750 or rented for \$50 to \$125/mo through Deltak's library plan.

Further details can be obtained from Deltak headquarters at East/West Technological Center, 1751 Diehl Road, Naperville, Ill. 60566.



# Exxon Office Equipment Divisions Join Data

STAMFORD, Conn. — Exxon Office Systems Co., formed from three of the company's existing office equipment operations, was in search of a data base system at the end of 1980.

Each of the three operations had similar computer systems in place for accounting, order entry and inventory control. "We had to find a way — quickly and efficiently — to combine all that information [from the three companies] into a single database from a host of field sales offices, manufacturing plants, warehouses and other field sites," according to Howard Maynard, Information Systems Director for Exxon Office Systems.

**Exxon Office Systems**, headquartered here, manufactures and markets office automation products that include information processors, electronic typewriters, systems products, facsimile equipment and printers.

It has branches or agents in more than 110 locations in the U.S. and an international operation in Geneva, Switzerland, with branches in six

## SWCC Slated For March 27

OKLAHOMA CITY, Okla. — The seventh annual Southwest Computer Conference (SWCC) will be held at the Myriad Convention Center here March 27-29.

The conference is a business and industry event running midweek, aimed at both management and technical personnel. Attendance at the 1983 SWCC was 10,000, and the 1984 turnout is expected to exceed that figure.

The conference will feature over 50 seminar presentations in addition to the 250 booths in the exhibition, according to a conference spokeswoman.

Admission is free with tickets, which can be purchased from the Southwest Computer Conference through P.O. Box 950, Norman, Okla. 73070.

primary European markets — the UK, West Germany, the Netherlands, Switzerland, France and Belgium. The company's products are marketed in other parts of the world by distributors.

## In Search of a DBMS

In search of a data base management system (DBMS), "we looked at 'packaged' systems, but they didn't meet what we had set

as our requirement for a totally comprehensive system," Maynard recalled. "There was, as far as we could see, no business that was exactly like ours. But if any company had to tailor a data base system to meet its own needs, we certainly had that capability."

The name for the system that emerged was Marketing Management System (MMS), a system used and developed

by Exxon Office Systems to handle internal basic marketing, financial and service transactions on its IBM 4341 minicomputer.

The types of transactions break down into two general categories: those transactions required in the product ordering, installation and payment cycle; and those transactions required to support a product after it is installed at the customer's site.

The system has more than 500 computer programs supporting these functions and data bases with more than 800 data items. In addition, the Exxon Office Systems computer center processes between 50,000 and 100,000 individual transactions each day in support of the business.

Economies in replacing three redundant systems with one began to bear fruit.

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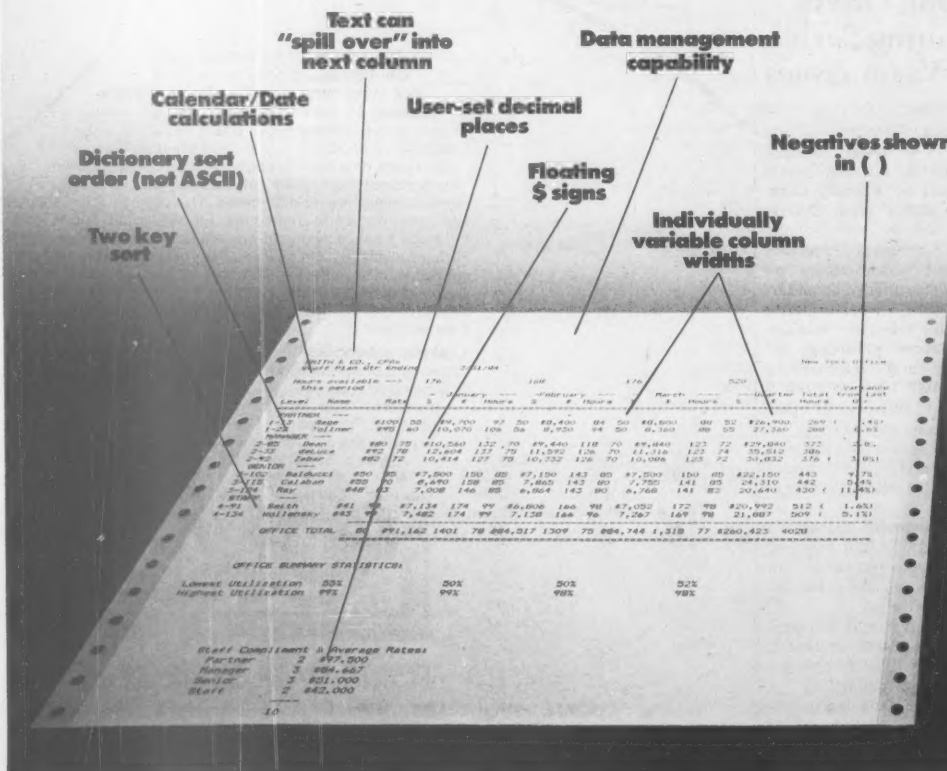
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# From Multiple Locations With Aid of DBMS

this year. The operating budget for Exxon Office Systems and its associated staffing levels is now substantially less than the total systems budget for the three companies that existed in 1980.

In addition, MMS strengthened control over processing transactions and managing the location and status of products. This stronger control comes from having the system respond

to more than 40 of the company's geographical locations and by having appropriate users responsible for inputting data at the source of the transaction.

For example, a customer service dispatcher will directly key in information on a recently repaired machine. A branch administrator will input information on a new sale.

In addition, the system

permits a strong control over the relationship between the sequence of the business transactions. It is impossible to record an installation transaction for a machine if the order has not been approved, allocated and shipped in the proper sequence, an Exxon spokesman said.

All the information is shared among locations, such as branches, headquar-

ters and plants, and among functions, such as sales, business planning and accounting, so the information is highly "visible." If any facts are missing or wrong, the error becomes apparent and can be corrected quickly.

## Implementing the Switch

All functions for all the products were implemented at the same time to eliminate the cost of building bridges

between old and new systems.

"An early switch-over date was established with the understanding that whatever was necessary to meet the deadline would be done and that management could rely on that date for the company's planned reorganization and consolidation," Maynard explained.

Two branch offices in Connecticut and New York were used as a test for the system before going live at all locations. Initially, MMS was restricted to the basics necessary to process business transactions. Improvements, enhancements and interfaces with other systems came later, once the system was operating in a satisfactory manner.

During the workday, the field has information regarding new sales orders, equipment allocation, de-installation, open orders, product inventory, pending installations, customer bases and pricing. After normal working hours, the system processes this information to provide all of the functional groups with over 50 different forms of hard-copy reports by 7 a.m. the following day.

For the branches, this system has eliminated 90% of the paperwork flow back and forth between locations. In a matter of minutes, administration can enter a sales order.

"The turnaround time for its approval is a fraction of the time taken when orders were handled by mail," said Terry Palumbo, administrative manager of the company's Southern Connecticut branch.

## The Future

MMS now exists as a smooth operating system handling all marketing, financial and service transactions. Exxon Office Systems has begun to build on the system to develop informational needs.

A system for reporting sales information using a relational data base system has begun to speed up the delivery of advanced business analysis data. It is updated by using both change logs and extracts of the transactions data base that are run daily.

"Now that we're fully prepared to answer our customers' questions professionally and quickly, we've begun the first phase of our informational efforts," Maynard said. "Using MMS, enhanced with our relational data base capabilities, we'll be able to answer the more complex questions from within our own organization for internal reports and analysis."

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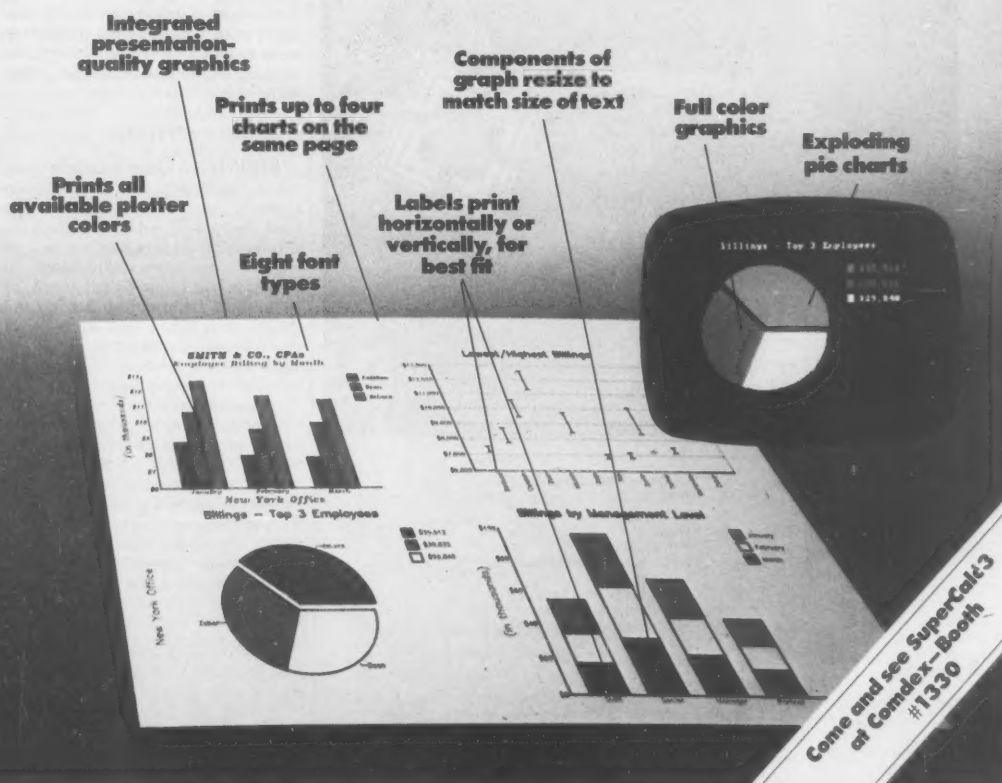
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# International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

## AUSTRALIA

**RYDE, N.S.W.** — A federal government project grant valued at \$90,000 has been awarded to the software house of Kingdom Pty. Ltd. for the research and development of a software process to "redefine our concept of the data base." In its first commercial application, the software will provide a new procedure for the solution of numerical and logical problems without programming, a spokesman said.

**MELBOURNE** — The Australian Telecommunications Authority (Telcom) has requested contract bids for a videotex system without for-

mally establishing a national videotex standard. Sources reported, however, that while inviting proposals from all videotex suppliers, Telecom has quietly named the popular French Prestel as the standard it will adopt, closing the door to the rest.

**CANBERRA** — Private investors have reportedly been excluded from any shareholding in Aussat Pty. Ltd., the Australian Satellite Operating Authority. However, the Australian Telecommunications Authority has been offered up to a 25% interest in Aussat. Speaking in the Federal Parliament last week, Minister of Telecommunications Michael Duffy said the government will ensure that

Aussat remains a commonwealth-owned company.

**FITZROY** — Australian Systems Engineering Pty. Ltd. (ASE) has unveiled a software utility that is said to automate repetitive manual tasks in IBM MVS batch environments during "start tasks" or time-sharing "logon completes." The software, called Ecxa, transfers sysout from JES2 and JES3 spool to Ecxa data bases and performs its own basic checking plus any user-specified checking to determine if execution has been successful, ASE said.

**SYDNEY** — In a move to increase its penetration into the Australian

marketplace, IBM is enlisting third-party vendors for its 4300 series sales community. Computer Power Group, a major Australian software supplier, has already supplied five 4300s to the federal government after receiving them from IBM at a special price, sources said.

## BRAZIL

**BRASILIA** — ABC-Empresa Telematic is the name of a new computer company jointly established by Brazil and the French nationalized data processing giant, CII-Honeywell Bull. The new company, which is 60% owned by Brazil's ABC and 40% owned by Bull, will reportedly manufacture Bull's line of medium- to large-scale DPS-7 computers for banks and other large DP users. Production is slated to begin in the first quarter of 1984. The production agreement reportedly allows Bull to get around tough Brazilian import restrictions.

**RIO DE JANEIRO** — To interconnect its Brazilian branches, Brazil's Citibank will use a microcomputer network developed here by the Electronic Communication Center at Rio De Janeiro Federal University. The network was initially developed with Citibank funds; the operational phase of the Citibank project is slated for mid-1984. The bank selected the University's network, according to Citibank Vice-President Erich Wilmer, because of its extensive capacity and because all of the network's components are home-grown. Meanwhile, in Brasilia, Mucio Doria, Brazil's subsecretary of the Special Informatics Agency, declared his firm opposition to signing any contracts with multinational companies, such as IBM or Burroughs Corp., for banking terminals or banking software.

## CHINA

**BEIJING** — China's largest computer, the System 757, has just been formally introduced here by the Computing Technology Research Institute. The supercomputer, all of whose components were made in China, is said to operate at speeds of 10 million instructions per second (Mips). It is based on a vector host processor with a 64-bit word length and a 4M-byte memory; it reportedly features vector computation capability, streamline architecture and parallel processing for large-scale scientific and engineering applications. The System 757 relies on a peripheral processor to handle housekeeping functions, relieving the high-speed host system. Available software for the 757 includes a multitasking operating system, vector Fortran, a compiler, assembler and a graphics package.

**BEIJING** — A computerized Chinese character editing and laser typesetting system developed by Beijing University has gone into mass production at Weifang Computer Manufacturers here. The typesetting system, which a spokesman claimed features an advanced information

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# International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

compression technique and highly accurate laser output, is said to compete with many systems from abroad.

## FRANCE

PARIS — Thomson-Brandt has unveiled its long-awaited optical digital disk called Gigadisc 1001 (GD 1001). The nonerasable medium measures 30 centimeters in diameter and is said to store 10G bytes of information on each face. It will be made available to the OEM market in two versions, one in a rack and one in a box. The optical disk is scheduled to be showcased during Comdex in Las Vegas this week, where Control Data Corp., Toshiba Ltd. and Storage Technology Corp. are also expected to introduce optical disks. To counter its foreign competition, Thomson has reportedly signed an agreement with Xerox Corp. to market the GD 1001 in the U.S. under the name Optimum 1000 via Shugart Associates.

## JAPAN

TOKYO — Sony Corp. has signed an OEM contract with IBM to supply high-quality color display systems for the IBM 5080 product line, as well as for a computer-aided design and manufacturing system scheduled to be released by IBM next spring. The 20-in. display was originally developed for Sony's television product line.

TOKYO — Scanon, Inc. has released a Japanese word processor called Canoword Mini 5. The machine is an all-in-one typewriter with keyboard, printer and LED display. Priced at \$1,268, the system will be available Dec. 20.

TOKYO — Cadix, Inc. has released the Cadix Auto Digitizer System 4001, which can reportedly read drawings automatically. Users of the System 4001 can input drawings into the system up to 200 times faster than by hand, the vendor claimed. The system relies on a linear scanner, which scans the data for one minute, and a dynamic random-access memory scanner that processes color data. The price of the system, which is based on a super high-speed image processor to process images with hardware rather than software, begins at \$212,766. It is scheduled to be shipped in January.

## MEXICO

MEXICO CITY — It is vital for Mexico to define a national policy dealing with the impact of computer technology on the economy and on society, Jorge Gil Mendieta, director of the University Computing Program of Mexico, told the "Future of Information Science in Mexico" forum here recently. He also maintained that any revolutionary advances in technology can result in major problems when acquired and incorporated into the nation's economy. Mendieta further argued that the technologies associated with computing are linked inextricably to the economic and political lifelines of industrialized countries, and nations like Mexico must establish poli-

cies and strategies now to minimize the negative consequences of the economic crisis that has multiplied the costs of these services and products by a factor of six.

ACAPULCO — All software contracts should be registered with Mexico's National Register of Technology Transfers, according to Luis Vera Vallejo, a legal adviser specializing in data processing. Vallejo recommended enforcing stiff penalties and fines — up to 10,000 times the value of the contract — on companies that refuse to comply with the proposed ruling. Vallejo made the recommendations at the recent First Annual Conference of Latin American Users

of McCormack and Dodge software here.

MEXICO CITY — During a recent conference called "The University View of Computing," Jose Warman, subdirector of Secofin Electronics Industries, contended that until universities "accept that they can see only one side of the computing coin," Mexico will not be able to establish a bond between the industrial, government and academic sectors. Warman accused universities of operating in a vacuum and likened Mexico's problem to an absurd theatrical drama with three peasants: the government, industry and the university.

## WEST GERMANY

COLOGNE — The Society for Data Integrity and Data Security held its seventh annual meeting here recently, discussing legislation related to the protection of sensitive data. An amendment proposed by Federal Minister Friedrich Zimmermann was sharply criticized during the meeting by society members who felt that the measure might reduce data security and integrity. Bernd Hentschel, chairman of the society, warned conference attendees of the potential dangers of the amendment. Other topics discussed included the problems of handling personal data and implementing new technologies.

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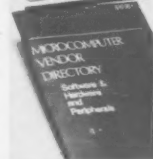


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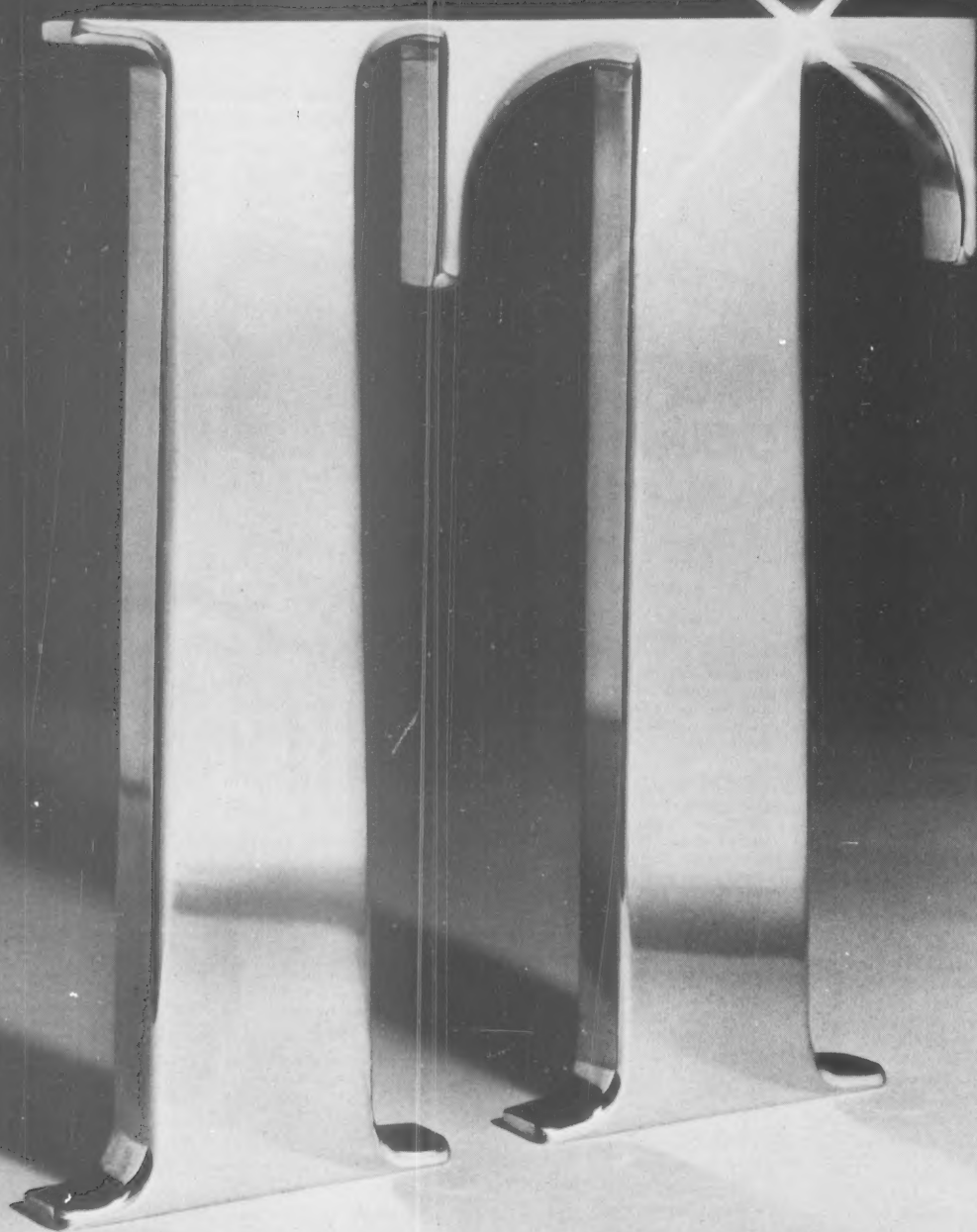
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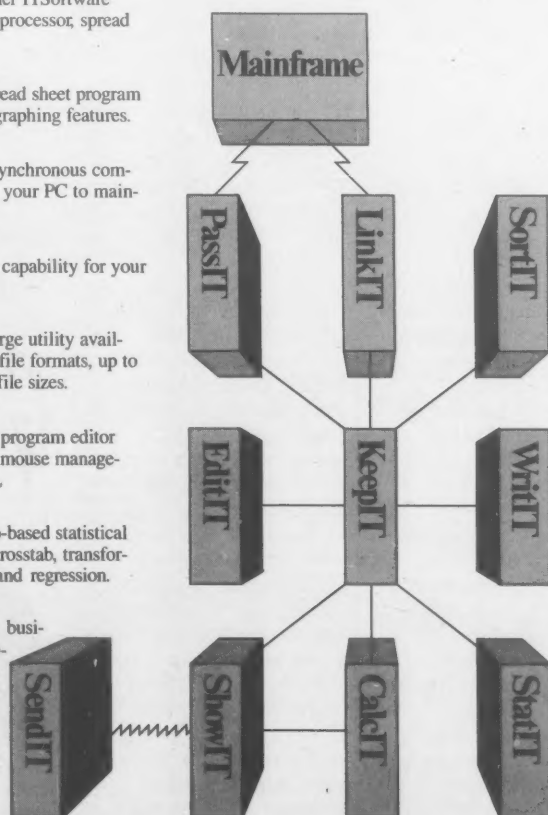
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# DBMS Controls Flow of Engineering Projects

CHICAGO — Two data base management systems have engineered some significant information processing solutions for Harza Engineering Co.

The company has been providing management consulting services for public and private civil engineering projects since the late 1920s. Today it employs some 800 engineers and clerical workers to supervise a score of projects in the U.S. and overseas, mostly in the area of water management and control — dams, power plants and irrigation and flood-control programs.

"Over the years, monitoring all the information for each project involved a lot of man-hours," noted Mark Allen, a Harza construction engineer who handles systems applications for the field. "Correspondence with our outside vendors — who supply special electrical and mechanical equipment — status reports and payment information all had to be recorded and tracked continually."

Harza was well aware of a growing need for some type of computer data base system to record and monitor this information without the addition of a lot of personnel, Allen said. Specifically, Harza needed a system that would enable it to store information in a large mainframe and distribute that data to microcomputers in field sites around the country.

"Such a system could be used as a tool to relieve a large part of the paper-oriented functions of our field engineers," Allen said. "This would mean less time spent on recordkeeping and more time spent on project management."

About a year and a half ago, Harza purchased its first data base management software system, Relational Information Management (RIM), developed by Boeing Computer Services Co. RIM was installed on a Harris Corp. supermini and, Allen said, immediately proved its worth by cutting down the time it took to track drawings for equipment used in various construction projects. These drawings were prepared by both Harza engineers and outside vendors.

Tracking drawings is a time-consuming but critical task in completing a project. "An engineer needs to know exactly what drawings are required for a job, when they will be needed and who's working on them," Allen stated. "With RIM we can record the information just by typing it into the computer. Then we can do a query on the system periodically to

find out which drawings are outstanding and which are completed. This saves a lot of time compared to doing the job manually."

"Another area where RIM has been useful to us is tracking correspondence," Allen noted. "Each project generates a lot of correspondence between engineers and vendors on who's doing what, what is the status of a particular project or piece of equip-

ment and why was it delayed or ahead of schedule. RIM helps us to get our hands on this information immediately."

Having met with success with RIM on its supermini, Harza then decided to try out Microrim, a relational data base management system for microcomputers manufactured by Microrim, Inc. of Bellevue, Wash. Wayne Erickson, Microrim founder


and president, was the chief architect for RIM at Boeing.

As a relational data base management system, Microrim organizes data into tables of rows and columns. The tables form "relations," which can be combined to form new tables. When any transaction updates an entry, the data base automatically updates all other related elements. Because all the elements share some common

relationship, the user can store, rearrange, retrieve, sort and present information in a systematic manner, according to Erickson.

The major advantage of Microrim for Harza has been the system's ability to exchange information with RIM. This allows data from the Harris minicomputer to be transferred to microcomputers in the field.

(Continued on Page 50)



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# EFT Vendors to Show Their Wares

NEW ORLEANS — Major vendors of electronic payment systems will highlight their product offerings during the upcoming National Automated Clearing House Association (Nacha) Conference, slated to take place here March 18-21.

The theme of this year's meeting is "Who's Who in Electronic Financial Services." On hand to discuss

the subject will be representatives from NCR Corp.; IBM; J.C. Penney Co.; General Electric Co.; and Visa U.S.A., Inc.

According to Nacha Conference Chairman Matthew Dillane Jr., the event will focus on "where we are, what's in store for the future and how we can manage and direct future electronic delivery systems." Dillane is vice-

president and manager of corporate services at First National Bank of Kansas City, Mo.

Twelve concurrent sessions will amplify the conference's topics, which include treasury automation; corporate bank relationships; corporate trade payments; cost efficiencies in delivering electronic services; developing market plans; case studies; electronic fraud; U.S. Treasury Department report; and point-of-sale systems.

Registration for the 1984 Nacha Conference is \$495 for members and \$625 for non-members. Further details can be obtained from Nacha headquarters at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

## Firm's DBMS Tracks Jobs

(Continued from Page 49)

Allen said Harza is currently trying to expand this capability into an on-going communication system between the home office and the field branches.

"We also send information on a micro-to-micro basis," Allen noted. "To do this, we send information over phone lines and set it into disks, then read it off with another micro."

Speaking of Microrim, Allen observed that "the latest version makes data entry easier because it provides a form on the screen that has prompts which tell you where to put the information in order to input it into the data base correctly. This is particularly helpful for the nontechnical user."

Moreover, Microrim was developed to provide reports that include a table with clear headings, a brief description of the information and the date. "If you have a package that makes setting up reports straightforward and easy, you save a lot of time," Allen said.

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## Software Quality, Productivity Improve Consumer Agency Using DBMS to Cut Backlog

WASHINGTON, D.C. — Faced with a legion of nagging problems, the Consumer Product Safety Commission (CPSC) decided to improve its applications system with the implementation of a data base management system (DBMS).

The existing applications system operating on the CPSC's IBM 3033 mainframe utilized IBM's DL/1, IMS and Storage and Information Retrieval System (Stairs) software. But the system was plagued with a variety of problems, including high maintenance costs, delays in responding to user needs, antiquated software design, redundant and fragmented files and awkward access to

data for reporting purposes.

One reason for the high costs and long development delays, according to John Clements, chief of the Systems Analysis and Programming Division, was that up to 75% of the programming staff's time was spent on maintenance of existing programs.

"The situation was exacerbated over time by the deterioration of the quality of the program code, which was being patched and repatched," Clements said.

"Also, the DP staff was shrinking through attrition caused by reduction-in-force threats and greener pastures elsewhere."

Clements said the hierarchical na-

ture of the data bases made it particularly difficult to keep up with user demands. In order to lengthen a field in a file, a programmer had to unload the whole data base, create a new schema and then reload the file.

Accessing data was also a problem because some data remained on sequential files while other data resided on DL/1 or Stairs files. Further, reporting was a problem because data had to be pulled across the various files.

A review team created within the commission set the following goals for the improvement of the applications system:

- Improved software maintenance and control.

● Faster response to user needs.

- Improved software quality.
- Increased productivity.
- Decreased overall costs.
- Implementation of newer technology.
- Centralized data files with easier data access.

The review team chose to implement an applications system based on Software AG of North America, Inc.'s Adabas DBMS and the Natural program development language. The first application updated with the new software, according to Clements, was the CPSC's National Electronic Injury Surveillance System (Neiss), which is an injury data collection system of selected hospital emergency room cases. The data collected through Neiss is used as a source for accident investigations conducted by the CPSC.

In May 1982, when the revision of the system was undertaken, the Neiss application ran under CICS with evening data collection by teletypewriter. Clements said the system inventory was comprised of some 287 functions, including 31 PL/I on-line macro-level programs, 74 PL/I batch programs, 46 batch reports, 15 different batch file maintenance and report procedures and 10 different utilities.

### Development Time Cut

Begun in 1974, the initial development of the Neiss application had taken two calendar years and about 120 man-months to complete. Under the new DBMS, according to Clements, the application was completely rewritten — with enhancements to the old functions — in only seven calendar-months with 14 man-months of effort. The Neiss inventory was reduced to only 82 functions, including 50 on-line and batch Natural programs, four Adabas files and 25 batch reports.

"With the aid of this DBMS technology," Clements said, "it only took one-tenth the people resources and less than one-third the time to completely redesign, reprogram and reimplement the system as an interactive application."

With the introduction of Adabas and Natural, Clements explained, programmers could lengthen a field by executing a utility program while leaving the file in place. Under the old system, changes in file structure that required modification of all interfacing programs often took weeks to implement.

In contrast, Clements said, the modification of Natural programs could be done interactively in minutes.

As a result of the conversion to the Adabas DBMS, maintenance requirements have dropped to about one-thirtieth of the original effort, Clements said. Moreover, "quick response to user needs is now a manageable problem based on real priority and not just backlogs of requests. We have attained better software quality and increased productivity, and our costs have decreased because we have less software to pay for and support."

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## Provides Response Services for Hertz

# Package Drives Programmers to Productivity

LOWELL, Mass — An organization based here that provides automated claims processing needed increased productivity for one of its client service operations. It found it in a software package.

Pilgrim Health Applications, Inc. (PHA), a subsidiary of Arthur D. Little, Inc., was contracted to provide customer information response services for Hertz Corp.'s Frequent Renter program and needed to automate the information data base. Previously, inquiry responses were accomplished manually from microfiche, and files included client registration and historical rental agreement data.

Initial system design focused on an enrollment range of 500,000 to 1.5 million individuals participating in the car rental company's preferred customer program. Such a system required immediate response to phone requests by renters seeking information on particular rentals, bonus points accumulated and awards eligibility.

PHA established goals to resolve all letter inquiries within 10 working days of receipt, issue program fulfillment awards within one week's time and answer all telephone queries on the spot.

An on-line access to computer files needed to be developed in a

minimum time frame.

The company set as criteria for a software system an application generator, an integrated data base management system and an integrated data dictionary. The selection process focused on productivity, on-line application development, dynamic systems analysis, capability of developing applications without procedural languages within the application generator, immediate testing and checkout of applications components, automatic screen generation, automatic documentation of data structure and application processes and procedures and ease of maintenance, training and use.

Another requirement for the software package was the ability to fit in the host environment — a National Advanced Systems, Inc. AS/3000 mainframe running IBM's VM, VS1 and DOS — without systems software changes.

After reviewing products of a number of major software vendors, the company selected DB1 from Software Craftsmen, Inc. of Boston. "The software system met our criteria, and the vendor offered a trial installation and assistance in developing our first major application," according to Gordon McAdams of PHA.

The vendor claimed programmer productivity would improve and that PHA's application would be accomplished in 30 days, he added. Installation required approximately four hours and did not affect production of regularly scheduled work in any way, according to McAdams.

The definition of the data structure and transactions for query were defined by the company's analyst working with the vendor staff during the second day; on Day Three a test data base was loaded to test and evaluate each user screen. At that point the application was ready for end-user and management review, McAdams recalled.

The data for the Hertz application was available on tape from another system already in place.

McAdams explained how the data base was loaded and updated in a batch mode: "Some difficulty was experienced in using the features of DB1 in this environment, and the vendor was able to resolve these matters, although operation of the data base between a VS1 batch environment and VM/CMS was new to the vendor field-support personnel. The loading and proving of the data base was accomplished in three weeks."

### On-Site Training

Training of the programmer/analyst for the system was held on-site and required 3½ days. This was performed in parallel with the application development.

Within three weeks the data base had been loaded and proved, and the application had been defined and loaded in anticipation of final review.

"At the end of the fourth week, the end users were trained in use of the system," according to McAdams. "In the initial group, only one individual had used a computer terminal prior to this training. A one-day training session was all that was required."

McAdams summarized the results: "The system has been in successful production for a period of two months. All goals for the improved service levels were met. Backlogs were disposed, and inquiry response is current."

"PHA's programmers have made major additions to the application, for example, adding a file of the historic information and setting up queries for this data. PHA is just beginning to feel the impact of this type of facility," he concluded.

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## TUTORIALS

**TUESDAY, JAN. 17**

**ALL-DAY SESSIONS — 8:30 a.m. to 5 p.m.**

- ① **Software Contracts & Licences**  
Speaker: Susan H. Nycum, of Gaston, Snow, Ely Bartlett; Palo Alto, CA
- ② **C Style and Portability**  
Speaker: Eric Allman, of Britton-Lee; Los Gatos, CA
- ③ **UNIX Systems Administration**  
Speakers: Ed Gould and Bob Kridle, of Mt. Xinu; Berkeley, CA
- ④ **Advanced Shell Programming**  
Speaker: Steve Bourne, of Silicon Graphics Inc.; Mountain View, CA
- ⑤ **Vi Editor**
- ⑥ **UNIX Systems on Local Area Networks**

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## /usr/group SESSIONS

## USENIX SESSIONS

**WEDNESDAY, JAN. 18**

- ⑦ **Keynote Address — 9 a.m. - 10 a.m.**  
Speaker: Jack M. Scanlon, Western Electric Company
- ⑧ **Joint Session — 10:30 a.m. - Noon**

- ⑨ **UNIX in Government — 1:30 - 3 p.m.**
- ⑪ **Market Research and UNIX — 3:30 - 5 p.m.**

- ⑩ **Networks — 1:30 - 3 p.m.**
- ⑫ **Distributed UNIX — 3:30 - 5 p.m.**

**THURSDAY, JAN. 19**

- ⑬ **Microcomputer to Mainframe Communications — 8:30 - 10 a.m.**
- ⑮ **Graphics Applications on Work Stations — 10:30 - Noon**
- ⑰ **UNIX to Microports — 1:30 - 3 p.m.**
- ⑲ **New Developments in Office Automation — 3:30 - 5 p.m.**

- ⑭ **Compilers and Languages — 8:30 - 10 a.m.**
- ⑯ **UNIX Directions — 10:30 - Noon**
- ⑰ **Applications — 1:30 - 3 p.m.**
- ⑳ **Implementations — 3:30 - 5 p.m.**

**FRIDAY, JAN. 20**

- ⑳ **Case Studies in Office Automation — 8:30 - 10 a.m.**
- ㉑ **UNIX Standards — 10:30 - Noon**

- ㉒ **Databasing — 8:30 - 10 a.m.**
- ㉓ **Open Session — 10:30 - Noon**

- ㉔ **Graphics - Computer Graphics Systems & Applications — 1:30 - 3 p.m.**
- ㉕ **Joint Session — 3:30 - 5 p.m.**

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TUESDAY			WEDNESDAY		THURSDAY		FRIDAY	
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1	2	3	8:30 - 10 a.m.	7 <sup>†</sup>	13	14	21	22
4	5	6	10:30 - Noon	8	15	16	23	24
			1:30 - 3 p.m.	9	10	17	18	25
			3:30 - 5 p.m.	11	12	19	20	26

<sup>†</sup>Keynote; session begins at 9 a.m.

**C**

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C-25

## DBMS Helps Laboratories Provide Diagnostic Support

COLLEGE STATION, Texas — The Texas Veterinary Medical Diagnostic Laboratory here maintains a satellite laboratory in Amarillo, Texas. Together, these two facilities perform the onerous chore of full diagnostic support for thousands of veterinarians practicing in Texas and elsewhere.

Histopathology, bacteriology, toxicology, clinical pathology, serology, theriogenology and parasitology are among the services provided. The lab, a state agency, receives, processes and reports well over 60,000 cases per year.

In 1979, the lab signed a contract with the DP center at Texas A&M

University to write an on-line case reporting and billing system. IBM's IMS data base management system (DBMS) and Cobol were utilized on an Amdahl Corp. 470V mainframe.

In late 1981, the director of the laboratory, Dr. Konrad Eugster, became concerned about the cost and reliability of the IMS DBMS.

In addition, attempts at retrieving the diagnostic data entered on the IMS in the previous two years (for descriptive studies) were unsuccessful.

In September 1981, Eugster hired Dr. Craig Carter as a computer section supervisor to study the feasibility of an in-house computer system for the lab.

The study revealed a probable cost-savings of up to \$300,000 during the first five years of in-house operation with a minicomputer. But to realize such a savings, the system would have to be operational within a year.

"After the usual justification, specification and bid process, a Prime Computer, Inc. 550 II superminicomputer was installed at the laboratory in the fall of 1982," Carter said.

"Rexcom Corp.'s relational data base system was chosen over the Prime DBMS and others. Careful study of the Rexcom package during evaluations of the bids convinced us that it would be the best value and would offer the most functionality for our particular operation."

### The Challenge

In October 1982, one programmer/analyst was hired, and development of the system began.

"The challenge at hand was to collect, validate and capture case history and laboratory data, allow timely real-time review and updating of cases and collation and printing of all related case data for mail out to the veterinarians," Carter said. "Also, we had to provide a retrieval system for all archived data. For instance, a veterinarian may wish to review all bovine cases in which a fibrinopurulent pneumonia along with a certain virus was found. In addition, a complete accounts receivable and billing system had to be written."

### System Goes Live

The system went live Sept. 1 this year and consisted of over 90 Rexcom programs and files, 27 Cobol programs, 125 Command Procedure Languages, Prime's job control language and miscellaneous Fortran and assembler subroutines.

"Our larger report programs were written in Cobol," Carter said. "The system is currently handling about 4,000 customers [veterinarians in the field], and the case data base will grow to about 20,000 on-line records. The response time for retrieval of customer or case records stays flat at about three to five seconds depending on the mix of jobs and users."

According to Carter, the drudgery of systems design and programming has been eliminated with this system, leaving only logical decisions to make regarding data management.

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# Hand-Held Computers Speed Service Reports

MILWAUKEE — After several hours of intricate electronic repair, the job is finally done. The equipment is back in perfect working order. The service technician, rather than reflecting on a job well done, now has to concern himself with completing those cursed service call reports and submitting them to the home office.

Sound familiar? Not anymore at Marquette Electronics, Inc., a manufacturer of high-tech computerized electrocardiogram equipment. The reason is that Marquette's service technicians use the very things that they are most comfortable with to compile and transmit their service call reports: computers.

With the use of hand-held computers manufactured by Quasar Co., Marquette technicians save time in writing out each report and mailing it to Marquette's headquarters here.

"We figure the hand-held computers will pay for themselves in just two years — even less depending on how much we can utilize them for diagnostic purposes," commented David L. Ivers, Marquette's vice-president of technical services.

He indicated that the use of the hand-held computers has resulted in more timely and accurate service call reporting and, therefore, more timely and accurate invoicing for service. After choosing the Quasar systems, Marquette began to develop software in January and had the service call reporting system on-line by May.

## Speeds Submissions

Marquette has approximately 80 service technicians who prepare a total of 50 to 60 work orders per day. When the technicians were preparing them manually, they would tend to wait two or three weeks and then submit several at a time.

This resulted in service invoices being mailed as long as six weeks after the service was performed in some cases. Today, 80% of the service call reports are prepared and transmitted in the same week the service was performed, Ivers said.

Each technician's hand-held computer incorporates, among other programs, a program to provide "prompts" for the technician to enter the information that Marquette will need to record and invoice properly the service call he has made.

The computer "asks" the technician for such information as his identification number; the customer's account number, P.O. box number and address; repair

start and stop dates and times; model number(s) of equipment serviced; parts numbers and quantities used; and other expenses incurred by the technicians in performing the work.

All of this is transmitted via a modem, also supplied by Quasar, over a Wats line to Marquette's internal computer system. From that point, each service report is edited for errors, used to pre-

pare an invoice if necessary and then permanently filed, Ivers said.

The program that is used in the hand-held computer will eventually be modified to allow the technicians to solicit diagnostic information from the company's data base and to order repair parts from headquarters. Marquette's sales personnel do not file their sales call reports on hand-held comput-

ers, but there is such a possibility for the future. Computerized expense reports for sales and service personnel are other possibilities.

Each Marquette technician is issued one of the Quasar hand-held computers after he joins the company. The service call report program is included in each computer.

Although Marquette's ap-

plication requires only the Quasar microcomputer and modem, combined with Marquette's own software, the Quasar hand-held computer is part of a portable computer system with three different microcomputers, 13 peripheral devices, adapters, such as printers and expansion modules, accessories and 16 software capsules that insert into the hand-held computer, Ivers said.

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# GM Expands Applications With OCR System

By Lynn Haber  
CW Staff

WARREN, Mich. — Utilizing an optical character recognition (OCR) system, which can read both typewritten and typeset material, the staff at the technical center of a major automobile manufacturer here says it has expanded applications to degrees never before thought possible.

"We had applications in this organization and in this corporation which have been identified for years, but because of the massive amounts of manpower required to create the data base, we never did it," said Michael Flynn, manager of Environmental Activities Staff for General Motors Corp. (GM). "The scanning and processing system have allowed us to develop applications that before we just couldn't conceive of doing."

The Kurzweil Scanning and Processing System developed by Kurzweil Computer Products, Inc. in Cambridge, Mass., is used primarily for three applications. "The first application is taking old file copy, say from the 1960s to the present, and scanning it and then sending it to a data base for search and retrieval purposes," said Barbara Sullivan, assistant coordinator of operations at the technical center. "This department works with the government and has to make proposals to certain standards, and these old files represent all the copy [it has] had for these standards."

## Electronic Communications

"Another application has to do with a department that works with overseas regulations. [It is] sending all copy to us, we're scanning it and electronically communicating it back to [the department], and it is formatting it for production of a manual."

The third application of the scanning system is in the production of GM reference manuals, previously produced by the company's photographic department.

The Kurzweil system utilizes artificial intelligence for inputting material directly to local-area networks or capturing text for editing on word processing systems. According to Michael Backler, a Kurzweil vice-president, the difference between his firm's OCR system and conventional OCRs is its ability to read typeset as well as typewritten material.

"The company was founded in 1974 with the idea to create first a product to convert printed text to speech — and not just typewritten material but typeset as well — and then at some future

point expand to a commercial version of the product," Backler said.

Originally, Kurzweil developed a system to convert text to speech for the blind. Today, the scanning and processing system converts printed information to computer-compatible form without rekeyboarding. Omnifont recognition software and specially designed hardware enable the company's

system to read both typeset or typewritten material.

According to Flynn, it was not until 2½ years after first seeing a demonstration of Kurzweil's OCR system that GM bought the system. "While doing some consulting work, I read an article that this system existed, and I and a couple of other people went to Chicago to see one of the first applications of the scanning system. We con-

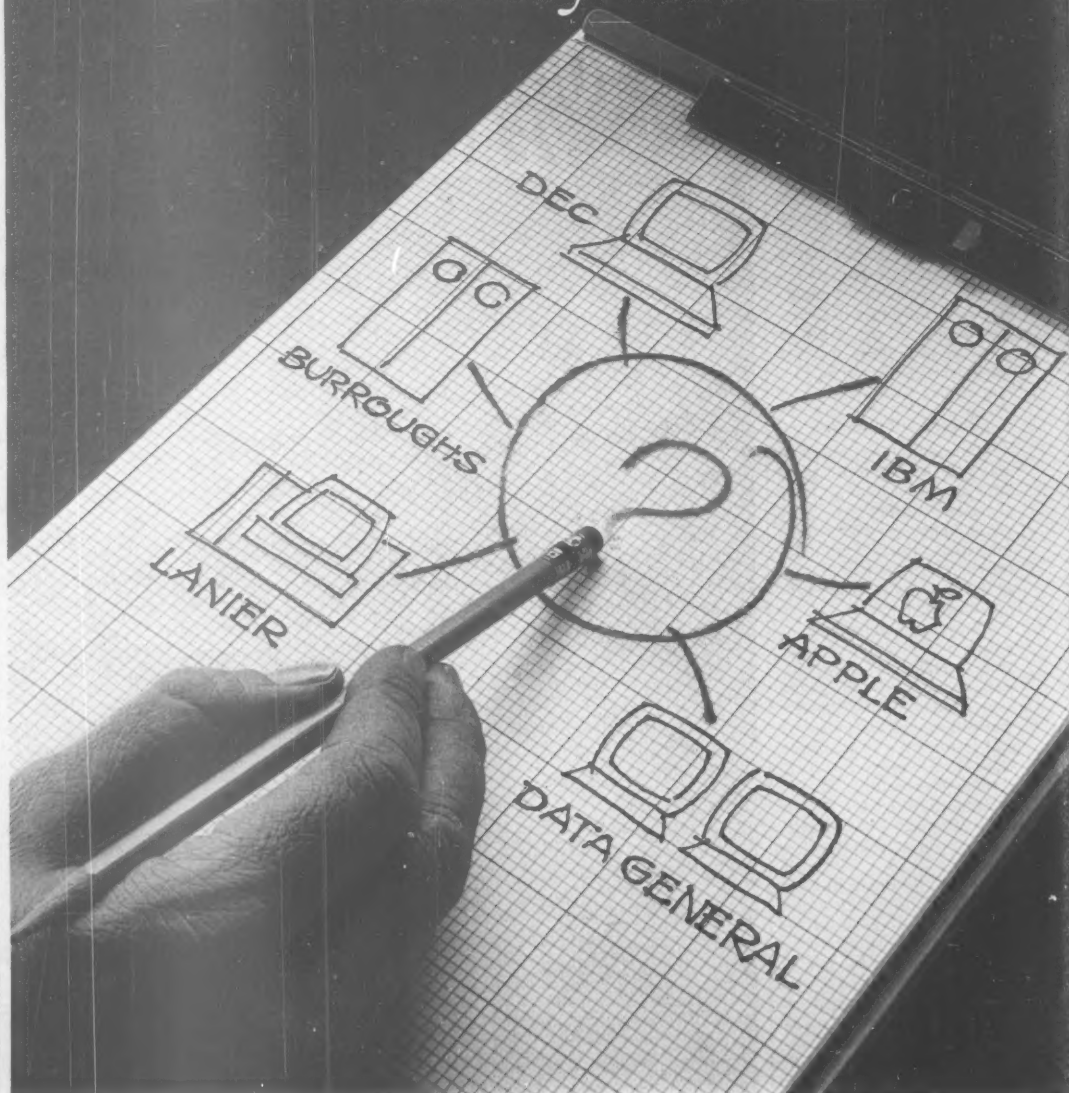
cluded that it provided a real solution to a very large problem — capturing archival files," Flynn said. "About 2½ years later, I found a problem that this system was the solution for."

"When we were specifying the office system requirements for this organization, we recognized that we were going to be creating, storing, retrieving and manipulating text and documents in an

electronic medium for all of our internal activities, but that we would have to interface with the outside world, which essentially was still being driven by paper," Flynn said.

"We decided then to provide an interface such that we could take all of this paper from the external world and convert it into the electronic media so that we could have a singular system."

●● If I invest in a multifunction workstation, how can I be sure it'll communicate with what I already have? ●●



## In-House Fiche System Cuts Paper Use Disk Maker Turns to COM for Info Management

LOUISVILLE, Colo. — In addition to producing disk storage equipment for sale to computer users, Storage Technology Corp. (STC) in 1979 held the dubious distinction of being one of the most prolific paper consumers in this state.

The paper deluge from financial statements, general ledger, payroll, field and

manufacturing inventories and so forth was not without its mounting cost. In an average month, the DP department alone produced 60 million pages of computer-generated data. Storing the paper files was cumbersome and costly, and the expense of buying paper for office use was running over \$3 million.

After a comprehensive study of the company's methods of information management, STC executives began to implement a computer output microfilm (COM) and micropublishing system in October 1979. Commenting on the COM acquisition, STC's corporate data center manager, Dick Mallot, said, "It was a matter

of dollars and cents. Based on the projected costs and savings, we knew that storing and accessing data on microfilm rather than tape would be a good business decision."

Initially, STC used a micrographics service bureau in nearby Denver to convert its data from tape to film. But as the company grew, so did the need for updating large

volumes of fiche data. The service bureau could not meet the daily work schedule required.

"Turnaround time was slow — often a week, a time frame we could not work with," Mallot said. "Many of the tapes being converted to COM contained data which was time-critical, and in order to have immediate access to data, we had to produce paper printouts in addition to film. When the microfiche was delivered, the paper was then thrown away, and the film was put into storage. Our requirement for immediate output led us to explore the benefits of an in-house COM program."

### In-House COM

The decision was made to convert to in-house COM, and the system chosen was developed by San Diego-based Datagraphix Corp. "When you realize that each microfiche translates into 270 sheets of paper and that the cost of duplicating a full fiche is three cents vs. 20 cents for a single sheet of paper, you instantly recognize the savings value of the transition," Mallot said.

"The low cost of fiche duplication means that information can be made available to more users without the excessive cost increases and time delays involved with the paper duplication of major reports. Add to that the space saved in storage and the data retrievability, and you appreciate the efficiency of COM as an information management system."

"Because of the tremendous volume of information that we produce, searching through mounds of paper files is extremely time-consuming," Mallot continued. "Each microfiche is produced with a little header across the top edge, readable without a magnifying device. The title header identifies the information contained on that particular microfiche. Additionally, the retrievability of microfiche data is made even more efficient by using the index frame, which directs the reader to any specific piece of information."

Microfiche is produced on Datagraphix 4590 roll-film recorders or on a Datagraphix Mini Autocom cut-fiche system. STC also uses Datagraphix microprocessor-controlled Datamaster duplicators to make its end-user copies. All users have microfiche readers at their desks or nearby to promote access to the information.

Utilizing Datagraphix  
(Continued on Page 60)

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**Term to Begin Jan. 1****Lewis Chosen DPMA President**

PARK RIDGE, Ill. — Carroll L. Lewis has been elected international president of the Data Processing Management Association (DPMA). His term of office will begin Jan. 1.

Lewis is owner and president of Commercial Data Corp. in Memphis, Tenn., where he is responsible for all marketing and applications operations of the firm.

A DPMA member since 1964, Lewis has served the association at chapter, regional and international levels. He has been instrumental in cultivating membership promotion and retention programs. He has also been involved in educational program development.

With 45,000 members, DPMA has more than 275

chapters in the U.S., Canada, Japan, Mexico and other countries. Its membership includes 32,000 computer management executives and 11,000 students majoring in computers in business.

**Disk Maker  
Adopts COM**

(Continued from Page 59)

Miniform software, a 16-bit minicomputer-controlled Autocom is a high-speed device designed to support a wide variety of input and output formats.

"We update many of our files and produce microfiche on a daily basis," Bert Shaw, manager of data operations, said. "And the turnaround time is short compared to the two weeks we used to wait when using a service bureau."

To micropublish and update its technical manuals, STC sends typeset, camera-ready manuals to a Denver micrographics service bureau. The manuals are then microphotographed onto titled and indexed microfiche, which are duplicated for distribution to STC field and home office staff. For updating, the company sends only the changed pages. The service bureau microprints the entire updated manual on a new master fiche.

**Educators Form  
National Council**

TORONTO — The National Council of the Canadian Community of Computer Educators (CCCE) was recently formed at the Canadian Data Processing Education Conference.

The purpose of the CCCE National Council is to foster, encourage and promote quality data processing education across Canada, according to a group spokesman. This objective will be accomplished through activities of regional groups and activities at the national level.

Currently, there are member groups in Calgary, Alta., Toronto and Montreal.

Further information on the council can be obtained by writing to CCCE, 4th Floor, 1200 Bay St., Toronto, Canada M5R 2A6.

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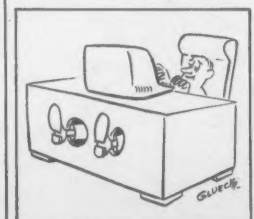
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## Automated Passport Readers Helping to Spot Suspects Passing Through Customs

CHICAGO — The U.S. Customs Service is now using a computerized passport reader system to speed returning U.S. passengers through customs inspections.

When a passenger walks up to customs with a U.S. passport printed in computer-readable type, the customs inspector inserts it into the computer system.

The traveler's name, date of birth and passport number are read automatically and checked against information stored in the San Diego-based Treasury Enforcement Communications System (Tecs), a computerized information network operated by the Customs Service's Law Enforcement Systems Division.

Within seconds, while the inspector proceeds with other duties, such as checking the passenger's baggage declaration slip, a response to the inquiry appears on a CRT display. The officer then determines whether to pass the traveler through or summon another official to examine the baggage further.

### OCR Devices

Currently at use in the international arrivals facility of O'Hare Airport here, the passport readers consist of specially adapted optical character recognition (OCR) devices manufactured by Caere Corp. of Los Gatos, Calif. Each unit is connected to a CRT terminal and hooked into Tecs.

This system also provides access to the Federal Bureau of Investigation's National Crime Information Center data base, which contains information on felons, smugglers and persons who have failed to declare items for customs tax.

Planning Research Corp. (PRC), an engineering and information systems consulting firm headquartered in McLean, Va., contracted with the Customs Service to install the automated passport readers.

PRC also designed and built the interface between the OCR equipment and the Tecs computer, as well as the automated system used by the State Department passport offices to produce the machine-readable passports.

"Most people are legitimate travelers, so a typical response from the Tecs computer will read 'No Record Found' on the inspector's screen," said Howard Bliss, manager of applications development at PRC's Systems Design Division. Bliss helped oversee installation of the passport readers and trains customs personnel.

On the other hand, if a passenger with an outstanding felony warrant attempts to pass through, Tecs will respond with 'Possible Match' and advise the inspector to ask the person for more identification. "If the individual is a suspected terrorist or criminal or is attempting to enter the country illegally, the inspector will flip a switch that immediately summons additional assistance to come to the lane and escort the suspect away," Bliss explained.

"As a matter of fact, the Customs Service apprehends more wanted felons than any other single government agency," he said.

As more U.S. citizens are issued machine-readable passports, the automated reader will also help the U.S. deal more effectively with terrorism by allowing the Customs Service to do a more thorough job of tracking people's movements in and out of the country. Currently, passengers are checked only against files of individuals with criminal records. With the application of Tecs, the Customs Service accumulates a record of each time an individual enters the U.S.

Presently, less than 20% of those in the U.S. who travel internationally hold machine-readable passports, but the State Department estimates that the number will increase to 50% by the end of 1984. The Customs Service has established automated issuance agencies in Chicago, Washington, D.C., Los Angeles, Miami and San Francisco. Eventually, machine-readable passport systems will be installed in 13 major cities, including New York, Philadelphia, Boston and Atlanta.

### Long Lines

Until all the old passports are replaced, customs agents must continue to follow time-consuming procedures that, at times, can result in long lines of passengers waiting to be processed.

"With the new machines, the inspector can facilitate the movement of passengers, as well as identify lost or stolen passports, because the system queries the passport number in addition to name and date of birth," Bliss said. "The automated readers also eliminate human error that often results from keyboard data entry."

According to Bill Nowak, supervisory customs inspector at O'Hare International Airport, inspectors using the new system have significantly increased their efficiency. "The passport readers are very simple to use," he said. "After receiving less than 30 minutes of training, our personnel can operate the machines with no supervision."

During the next few years, the Customs Service will work with PRC to install hundreds of passport readers at major U.S. airports. With the summer Olympic games in Los Angeles less than one year away, the agency has selected Los Angeles International Airport as its next target site.

In the future, Bliss anticipates that other nations will follow the U.S. lead in issuing machine-readable passports.

"The move toward these new passports is the result of a standard published by the International Civil Aviation Organization," he explained. "A panel on passport cards worked for nearly 10 years to develop the standard, and the U.S. and European countries actively participated in this effort."

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## Searches Vehicle Titles, Registrations Microfilm System Cuts Agency's Retrieval Time

SALEM, Ore. — The Oregon Department of Motor Vehicles (DMV) here claims it has improved the quality of its services by installing a microfilm system.

The microfilm system works in conjunction with two IBM 370/158 mainframes.

Some simple requests for information can be accomplished by calling the information on an on-line CRT terminal. For example, identifying the owner of a particular vehicle or license plate is a straightforward process. But other requests are more complex, noted Doug Manthe, assistant administrator at the DMV.

For example, obtaining a list of all the previous owners of a certain vehicle requires searching original documents, such as a title. In Oregon, computer-indexed microfilm images of original documents make such inquiries easy, Manthe said.

The state's Motor Vehicles Division has information relating to vehicle titles and registrations and to driver's license suspensions stored on microfilm marked for automated retrieval. Manthe said the DMV has been microfilming title documents for some time. However, in the past year, the division adopted an indexing system that cut retrieval time from several minutes to a few seconds.

At the same time, he said, the DMV extended its microfilming and

indexing operation to registration and driver's license suspension documents.

"Formerly," Manthe said, "vehicle registration files were paper envelopes stuffed with documents. They were filed in what we called 'blocks.' To find a specific document, you had to know which branch office it came in through, the date it passed over the counter and, preferably, what batch it was filed in."

"Now we can enter the license plate number or the title number or the owner's name on a computer terminal, and the display will lead us to the desired document-image's microfilm location. Once we load the right magazine into the Kodak [Corp.] IMT-150 microimage terminal and enter the location on the key pad, the image appears," he said.

### Two Different Approaches

Because of the operating differences among driver's license and vehicle service branches served by the division, DMV uses two different approaches to microfilming incoming documents on its three Kodak Recordak Reliant 750 microfilmers.

In vehicle registration, there was a computer program in place that captured all data on titles and registration. Rather than adopt new software, the division enhanced its old program to index document images. Consequently, the vehicles service

branch first keys data from documents and then microfilms them in the same order.

To help avoid errors, the computer produces a daily report listing all the documents sent to microfilming for verification, Manthe explained.

Because there was no equivalent program for driver's license information, the driver's license branch elected to "front end" microfilm suspension notices, conviction records, return envelopes and other documents in these files.

This means the documents are microfilmed before data is keyed. The microfilmer imprints each license document with a unique set of digits. When the documents go to data entry, these codes are keyed to create an index, according to Manthe.

The DMV's information retrieval system uses three sizes of image marks that are automatically applied by the microfilmers. The marks, which appear adjacent to each document image, are used by the IMT-150 units to locate specific images automatically.

For example, the driver's license system uses two sizes of image mark: one for batch identification sheets, another for individual items. The vehicle registration file uses three sizes.

The largest mark corresponds to the batch identification sheet, the middle one to images of actual title

documents and the smallest to "source documents," such as change-of-address notices and requests for change of title.

Individual microfilmers are set up to make the microfilming process as efficient as possible. The driver's license microfilmer, for instance, always produces a small index mark, except when the operator touches a foot switch.

The microfilmers accept a variety of documents in all weights and colors of paper, from title forms on heavy stock to lightweight carbonless forms and newspaper clippings.

According to Manthe, microfilming license suspension records and vehicle registration information has saved filing space; all of the division's suspension, registration and title documents are now contained on about 500 microfilm magazines. But the real savings, he said, is in personnel time spent looking up information to answer some 400 daily requests.

Oregon's population is relatively small, yet it is known as an innovative state in many areas — land-use planning, environmental control and fiscal management, to name a few.

In terms of applying microfilm and computer technology to problems of file space and information retrieval, Oregon once again has proved to be an innovator.

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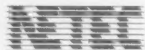
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# Telecommunications Meet To Assist Developers, Execs

WASHINGTON, D.C. — Advanced telecommunications and information processing equipment and services will be featured at the Multi-Tenant Telecommunications Opportunities Conference and Exhibition Showcase to be held at Stouffer's National Center Hotel here Dec. 12-14.

The sponsor, Telestrategies, Inc., said the conference will highlight multitenant telecommunications opportunities by focusing on the multitenant marketplace and private branch exchange (PBX) regulation. Other topic areas to be covered are: in-building wiring, multitenant telecommunications marketing, multitenant system operations and the

shared telecommunications arena.

The conference is designed, the sponsor said, to assist real estate developers and telecommunications executives in developing business strategies to meet "the opportunities posed by the inclusion of telecommunications enhancements in property development." Exhibitors at the conference will showcase equipment for end-user sharing, such as PBXs, customer billing equipment, word processing equipment, software and services, electronic mail and microwave and satellite equipment.

Among the scheduled speakers are Dr. Jerome Lucas, president of Telestrategies; Gardner McBride, executive vice-president of the Building Owners and Manufacturers Association; John Daly, telecommunications manager for Planning Research Corp.; Leonard Cozza, director of United Technologies Communication Co.'s Integrated Office Services; Robert Grant, district manager for the Central Services Organization; and Robert Schmidt, vice-president of operations for Telemanagement Service Corp.

The cost to attend the full three-day Multi-Tenant Telecommunications Opportunities Conference and Exhibition Showcase is \$995. Further information can be obtained from Telestrategies, 6842 Elm Street, Box 874, McLean, Va. 22101.

## DPMAEF Elects New Regent

PARK RIDGE, Ill. — M. Herbert Schwartz, general manager at Software Quality Service, Bethesda, Md., has been elected to a three-year term on the board of regents of the Data Processing Management Association Education Foundation (DPMAEF).

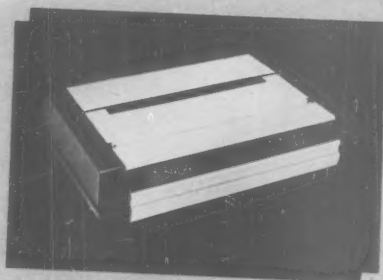
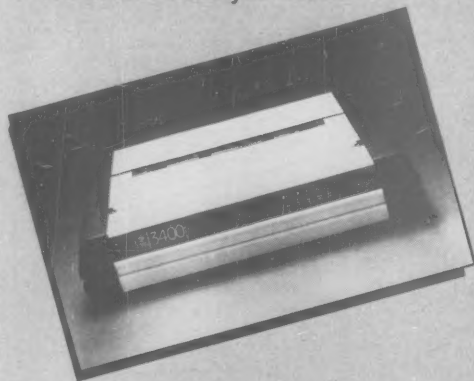
Schwartz, an early advocate of managing quality objectives in the information processing profession, joins a six-member board.

Prior to his association with Software Quality Service, Schwartz served as statistician at the Federal Reserve Bank of New York; economist, chief analyst and director of data processing at the Federal Reserve Board; director of management information and telecommunications systems with the Atomic Energy Commission; vice-president at Citibank in New York; and concurrently, for more than 20 years, adjunct professor of management systems at George Washington University.

In professional activities, Schwartz was the program chairman for the DPMA 1983 Information Systems Education Conference and is the department editor for information systems management of the Communications of the ACM.

In addition, he has served as president of the Society for Management Information Systems, as a member of the American Management Associations Planning Council for Management Systems and chairman of the education committee of the National Economists Club.

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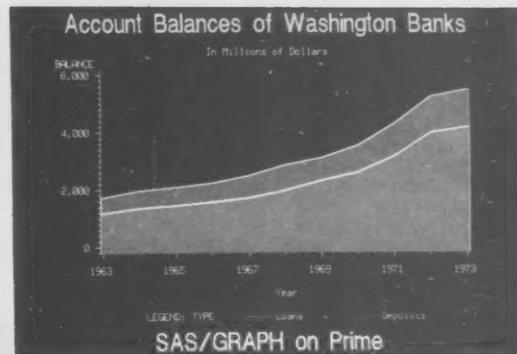
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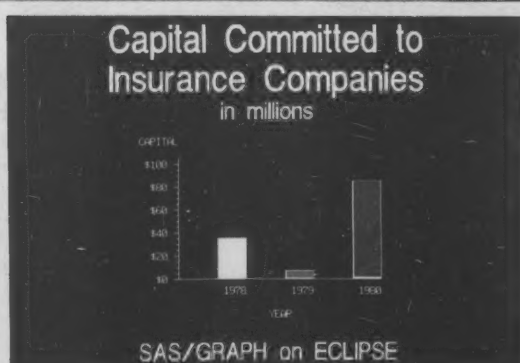


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# Hydrant Maker Tries to Put Out Security Fires

DECATUR, Ill. — Mueller Co. is a manufacturer of water and gas distribution equipment. Headquartered here, the family-owned concern also has manufacturing facilities in Albertville, Ala., Chattanooga, Tenn., and Clinton, S.C. Mueller's product line includes fire hydrants, and over 60% of the fire hydrants made in the country carry the Mueller name.

Mueller's data processing is distributed and spearheaded by an IBM 4341 processor here and 4331s in Chattanooga and Albertville. IBM's DOS/VSE, CICS/VS and DL/1 are key components of Mueller's software environment, according to Michael T. Leatherman, manager of technical support.

Historically, Mueller's data processing could be characterized as batch-oriented. Key punch personnel created card input to key application systems that generated the manufacturing and financial reports management used to run the company, Leatherman said.

Over the last few years, Mueller has followed the trend toward on-line, real-time processing, and an increase in CICS access to key data files has resulted. Currently, the company uses Management Science America, Inc.'s general ledger, accounts payable, accounts receivable and order entry packages. Mueller also uses IBM's Copic manufacturing software, according to Leatherman.

## Concerned About Security

Since virtually all of Mueller's key data files are now accessible on-line, top management became concerned about data security. Management felt a need to control access to key files and asked the management information systems department to design and implement a data security system, Leatherman recalled.

Mueller's main objective was to implement a security system that eliminated or minimized the chance of an accidental update to a data file. This was a common security threat and possibly the most destructive. Although it is difficult to pick up a newspaper without reading about a teenager with a microcomputer dialing into a company's mainframe, Mueller felt the most vulnerable to internal terminal operators accidentally updating the wrong file. The system had to protect from within as well as from unauthorized external access.

The first step was to investigate the security measures offered by CICS. Mueller discovered CICS provided only 24 assignable security keys. Further, CICS only protected transactions; it contained no file protection, no program protection and no terminal control. The firm could not make certain terminals available only at certain times, and with CICS there was little control over who could do what. Based on these limited capabilities, Mueller decided to investigate data security systems marketed by independent software companies, Leatherman said.

The firm reviewed the packages available and found that they all provided a more complete security facility than native CICS. The concern was to select the package that offered not only the most comprehensive se-

curity system, but an easy method of implementation. The firm decided that the Surveillance package from Towers Systems, Inc. of Irvine, Calif., was the best available, according to Leatherman.

Surveillance protects virtually every CICS resource: transactions, programs, data files, data destinations, terminals, even fields within DL/1 or Vsam data records, Leatherman said.

Essentially, Surveillance employs a three-tiered security concept. A master operator allocates CICS resources to supervisor operators, who in turn distribute these resources to the various general operators under their control. This concept was perfect for Mueller because it provided

for centralized control but decentralized administration and maintenance, Leatherman said.

The key to implementing Mueller's security system was good planning. In preparation for the installation of Surveillance, the firm analyzed the CICS Program Control Table and sign-on table to develop an initial security scheme. In many cases, Leatherman said, the firm made assumptions regarding access to certain resources. As a rule, access was not given if managers were not sure it was deserved. If a supervisor complained and the complaint was justified, that group's cluster could be changed in a matter of seconds, and the change was effective immediately. Once the package was in-

stalled, it took only four hours to implement the scheme using the menu screens.

Currently, every terminal on the network, both local and dial-up, is protected by Surveillance. On each terminal, particularly the dial-ups, only certain sign-ons are valid, and only a limited number of sign-on attempts are allowed before the offending terminal is locked out. This effectively eliminates any possibility of malicious security violations.

Additionally, other on-line systems such as IBM's Interactive Computer Control Facility are available only to certain individuals, and access is granted only after proper sign-on through Surveillance, Leatherman said.

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## Increases Responsiveness at City Hall Micro System Serves New York's Neighborhoods

NEW YORK — A microcomputer system has been installed at 35 Community Boards located throughout the five boroughs here to increase speed, efficiency and responsiveness in city government.

Each Community Board serves a cluster of neighborhoods, consisting of 100,000 to a quarter-million residents. Although established over 30 years ago, it was not until 1975 that an amendment to the city charter expanded the role of Community Boards to their present status of local city halls, close to the people, responsive to their needs.

Each board consists of up to 50 people, volunteers appointed by

their borough president, who live, work or have a significant interest in their Community Board District. They, in turn, operate a full-time office within the community, staffed by paid professionals headed by a district manager.

### Need for Computer

Bob Acito, district manager of Community Board No. 6, one of the 18 boards into which Brooklyn is divided, has a salaried staff that consists of two full-time workers, including himself, and two part-time employees. A total annual budget of \$85,000 covers all expenses including salaries, rent, equipment, phones,

and postage. Last summer, Acito recognized that if he had a computer system, his staff could do a far better job by responding more efficiently and effectively to his district's needs.

Acito was not alone in this evaluation. A number of district managers had come to the same conclusion: A computer system would be a valuable asset to their boards' operations. They elicited the interest of Denise Scheinberg, Mayor Edward Koch's right hand as Community Assistance Unit (CAU) director, and the Mayor's Office of Operations, and as a result, invitations to submit proposals were sent out to computer systems manufacturers.

In June of this year, 35 Zenith Data Systems Z-100 computers, each equipped with a dual floppy disk drive and a high-speed printer, were installed.

### Sixteen Committees

Acito's board is organized into 16 separate committees, each handling a critical area of activities, such as housing, public safety, education, economic development, social services and budget. "Using manual techniques, we simply couldn't handle the mailings alone required to communicate to everyone we need to reach in order to make the committees effective," Acito said. "Now, with this system it's a snap."

Instructors from Erin Computer Learning Center (ECLC), headquartered in Farmingdale, N.Y., provided intensive on-site training at board offices.

There is a high level of enthusiasm for the new computer systems in the board offices. According to the district managers, they will now be able to take truly effective action in many areas where previous manual operations were inadequate.

The next step will be the integration of these individual systems into a Community Board network tying all the boards together, enabling each to communicate directly with other city agencies as well as to each other.

## Deltak Series To Expand On MVS/SP JCL

NAPERVILLE, Ill. — Deltak, Inc. has announced five courses representing the second half of its "MVS/SP Job Control Language" series.

The 10-course series, No. 23-0XX-ME, was developed in conjunction with Duotech, Inc. for presentation on Apple Computer, Inc.'s Apple II+ microcomputer.

Both Part I and Part II of this series were designed for anyone who codes and uses Job Control Language (JCL). Within the 14 to 19 hours required to complete Part II, the student learns how to create, use and manage partitioned data sets, how to code a variety of parameters for defining and controlling data sets and how to control execution, security and recovery, according to a Deltak spokesman.

The final two courses teach how to modify jobs for cataloging, create and execute cataloged procedures, use overrides when invoking cataloged procedures and read and interpret the JCL listing and its messages, the spokesman said.

The series was designed for self-instruction and is presented through videotapes and text. The courses are available for an average monthly rental of \$50 to \$125 per course, depending on volume. Purchase price is \$1,750 per course, according to the vendor.

Further information is available from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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## In Overtime Within Year

# Power Stabilizer Saves Pa. DP Site \$500,000

HARRISBURG, Pa. — A power stabilizer costing \$64,000 saved a large computer facility here an estimated \$174,000 in hardware replacement costs and an estimated \$500,000 in overtime within a year after installation.

The savings from drastically reduced failure rates were experienced at the main computer facility of the Pennsylvania Department of Public Welfare, according to Fred A. Wieseman III, director of the department's Bureau of Technical Services. Within the last two years, the department's data processing growth has exceeded 100% in processing power and has required 800 additional terminals,

boosting the department's telecommunications network to more than 1,300 terminals throughout 67 counties processing 500,000 daily transactions. "With this type of rapid growth and enormous user dependence of the terminals to process this type of daily volume, power stabilization is mandatory," Wieseman said.

The central facility uses a Sperry Corp. 1100/84 processor running from a 60Hz to 415Hz MG frequency converter that automatically conditions utility power to the mainframe. However, until November 1982, there was no power conditioning or protection for the center's 60Hz periph-

erals, which include 100 Sperry disk drives and 22 controllers.

### Downtime "Intolerable"

"Sometime in August 1982," according to Wieseman, "we became aware that the frequency of disk drive printed-circuit board failures and failures of head disk assemblies was getting out of hand. The system was being interrupted and downtime was excessive, and this was an intolerable situation. As a result, we formed a task group which consisted of our DP operations director, James Gray, and representatives of the Sperry engineering group to survey exactly how many times we had sys-

tem interruptions and the cause of the problem. The Sperry people installed a Dranetz power monitor to determine the quality of power we were receiving from our utility."

The survey covered the eight-month period from January 1982 to August 1982 and documented 20 printed-circuit board failures in the 5056 and 5046 controllers, 42 disk drive failures, 24 failures of 8470s and eight failures of 8450s, an average of eight printed-circuit board failures a month and two and a half head disk assembly failures a month, according to Wieseman.

"The average monthly cost for [printed-circuit] card and [head disk assembly] hardware replacements alone was \$14,500, but far more serious was the havoc such fallout could cause in the field due to incorrect computation and other errors, lost processing time and overtime required every time our system would fail, causing downtime," Wieseman said.

"In fact," he added, "we actually documented the department's cost of overtime required by system downtime attributed directly to failures of 60Hz peripherals in September and October 1982 at \$200,000. That was just for that two-month period."

The task force soon found the cause of the problem as revealed on the Dranetz power monitor tapes: periodic surges and sags coming into the 60Hz power system from the utility — spikes were recorded in excess of 100V on each input phase.

On the recommendations of the Sperry engineering group, the department decided to obtain a 300 kVA Piller 60Hz Motor Generator Power Stabilizer from K/W Control Systems, Inc.

### Dramatic Reduction in Downtime

The results were more dramatic than expected. "We have now had a full year's experience since the Piller 60Hz Power Stabilizer was installed in November 1982," Wieseman said. "During that entire 12-month period, we have had a total of two printed-circuit board failures and one head disk assembly failure. Based upon the average failure rates we were experiencing before we installed the power stabilizer, we could have expected a total of 96 failed printed-circuit boards and 31.2 head disk assembly failures during that same period without the power stabilizer and, of course, a commensurate amount of system downtime."

The power stabilizer paid for itself within six months on the basis of printed-circuit board and head disk assembly hardware replacement costs alone. It also saved an estimated \$500,000 in overtime costs directly attributed to power-related failures causing downtime to the peripheral equipment.

"My own conclusion is that conditioned power is imperative in any DP system, and not just for the mainframe but all 60Hz peripherals as well. This is particularly true of any on-line system such as ours which operates through a large telecommunications terminal network," Wieseman said.

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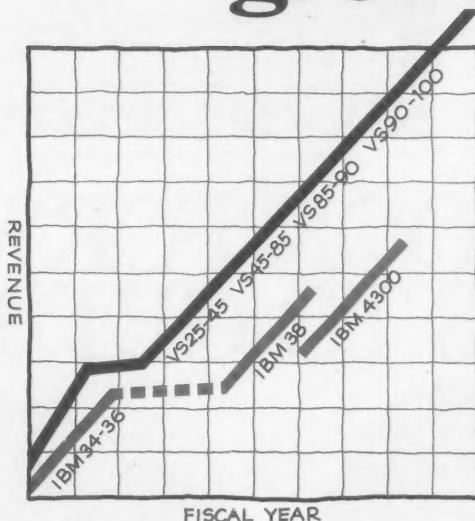


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## Advertising Agency Turns To Computer Graphics For High-Tech Imagery

FORT LEE, N.J. — Inspired by video games, Michaels Advertising, Inc. wanted to use a high-tech approach to advertise its client's nickel plating method for circuit boards. The advertising agency hired a computer graphics firm to develop a three-dimensional *Star Wars* motif.

The advertisement, which cost \$1,000 to develop, marked the first time computer-generated graphics were used in an industrial advertising campaign, according to Joe Michaels, president of Michaels Advertising.

The campaign was developed to illustrate a palladium-nickel alloy plating solution used by Engelhard Corp. and sold to the electronics industry. The process is used to develop circuit boards, connectors and semiconductors. The nickel plating method can be substituted for acid-hard gold and other precious metals at less cost, Michaels said.

"After looking through magazines," Frank Alansky, vice-president of the Michaels agency said, the agency felt "computer graphics was the way to communicate the characteristics and merits of the palladium-nickel solution. The high-technology capabilities of computer graphics expressed and underlined the nature of the plating process. And convention-

al board art could not do what we wanted to do."

The ad centers around a globe in space, which symbolizes the worldwide application of the new plating solution. The ad uses gold color running into silver lettering to indicate the potential changeover from gold to the new, silver-colored palladium-nickel process, called Pallnic.

To compose the computer-generated artwork for the ad, Michaels Advertising in September 1982 commissioned Genigraphics Corp.'s New Jersey Service Center in Florham Park. Genigraphics, a manufacturer of computer slide-generating equipment, operates a nationwide network of 20 service centers that provide full-color, computer-generated graphics and slides.

Working from the sketch developed by Alansky, Genigraphics composed three preliminary versions of the ad using a Digital Equipment Corp. PDP-11/23 minicomputer.

Genigraphics used multiple drop-shadow and step-and-repeat techniques to produce the sweeping color shifts and text transitions that symbolized the changeover from gold plating (starting in 1973, when gold was cheap) to silver (stopping at the year 2003, when Engelhard ex-

(Continued on Page 71)

1973: GOLD

The palladium-nickel plating process of the future that can save you money today: ENGELHARD'S PALLNIC

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WEST CENTRAL REGION, EAST NEWARK, NEW JERSEY  
ELECTRO METALLURGY DEPARTMENT  
PHONE (201) 286-7970 • TELE 848999

Principal Overseas Electroplating Locations:  
• Australia • England • Italy • France • Japan

2003: PALLNIC

The Ad Created by Computer-Generated Graphics

## WHAT TO LOOK FOR WHEN TRIES TO GET ITS F



## Striving for Affordability

# Statistical Software Maker Turns to Micros

LOS ANGELES — In the dawning of the microcomputer era, a software firm here faced a problem that many of its competitors were encountering. Because its software was available solely on large data processing systems, only professional organizations with sizable budgets could afford to use it.

What was needed for business and home applications was a smaller, more affordable desktop microcomputer to run statistical software, said Jerry Toporek, vice-president at BMDP Statistical Software, Inc. The company produces statistical software for all aspects of medical, educational and marketing research, as well as government and business operations.

At the same time microcomputers were gaining momentum, an intelli-

gent workstation for the engineering and scientific market was being developed by Callan Data Systems, Inc., a young California company based in Westlake Village.

The use of the Callan hardware in the BMDP Statcat Microcomputer made the statistical software available for the first time at the desktop level, Toporek said. The company is presently working on a package for the IBM Personal Computer series, he added.

The laboratory and classrooms of the Center for Health Sciences of the University of California at Los Angeles were the breeding grounds of BMDP Statistical Software, where a team of statisticians and computing experts 20 years ago first developed the software now used on the BMDP Statcat Microcomputer. Originally

funded by the U.S. government, the software became a standard statistical package for research groups in education, medicine, government and business for analyzing and managing data.

Toporek explained the decision to link up with Callan: "After working with other microcomputer companies during the past year, we decided on Callan based on the high quality of the hardware, its price and our ability to interface effectively with the hardware and software staff."

A Statcat system includes the Callan CD100M workstation with a desktop terminal featuring the Motorola, Inc. 68000 processor, a 10M-byte Winchester disk drive, a 600K-byte floppy disk drive and 768K bytes of random-access memory (RAM).

Toporek said the company did not even consider getting into micro packages until the 68000 chip and the Unix operating system became available. "Unix had the power to run our programs, which require 350K to 600K bytes of memory. ... We knew we needed the tools available in Unix," Toporek said.

According to Toporek, the BMDP output manager supports interactive use of the software. Entire session input and output may be viewed through horizontal and vertical scrolling on the screen. Data can easily be moved between the Statcat and other computer systems through serial communications or Xerox Corp.'s Ethernet local-area networks.

The complete set of BMDP programs in the 1983 release for mainframe computers is available for the Statcat. Programs feature data description, plots and histograms, frequency tables, missing values, regression, nonlinear regression, analysis of variance and co-variance, nonparametric analysis, cluster analysis, multivariate analysis, survival analysis and time series.

Other available software includes the standard Unix operating system with utility programs such as text formatting; phototypesetting; compiling and editing; Jtalk, a program for terminal emulations and file transfer; and J, a full screen editor written by Network Research Corp.

## Graphics Gives High-Tech Image

(Continued from Page 70)

pects its plating process to become the dominant technique).

Alansky estimated that the computer-generated art was created in just over five hours, compared with an estimated 90 hours required in traditional board-art illustrations, including time required to manually complete revisions and reworkings. "It would have cost us close to \$5,000 in time charges alone to achieve sim-

ilar effects manually, and I doubt that airbrushing, line illustration and four-color process work could do the job," he said. "Instead, using Genographics capabilities and services, it cost about \$1,000, including all the changes, computer time and the 46mm slides."

Alansky composed the artwork and copy separately "because at the time we completed the graphics, the copy was not finalized. The design

incorporated flexibility in the size of the art, which would need to be adjusted according to the amount of copy, and the copy was under constant revision."

The ad was completed by January 1983 and has appeared in a number of industry publications, including *Metal Finishing*, *Plating and Surface Finishing*, *Products Finishing*, *Insulation/Circuits and Electronic Packaging and Production*.

# N A COMPILER COMPANY OOT IN THE DOOR.



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## By Providing Info to Handle Situation

# Data Base Helps Clean Up Toxic Waste Spill

RICHMOND, Va. — When gallons of a highly toxic chemical spilled from a crippled truck here recently, the Henrico County Hazardous Incidents (Hit) Team turned to a computer to devise a response.

The Hit Team was notified early one morning that a tanker truck filled with perchloroethylene, a chemical used in dry cleaning, had overturned on Route I-95 here, spilling more than 200 gallons of the dangerous substance. Fire Captain R.C. Dawson, who heads the Hit Team, contacted the emergency room staff at Virginia Commonwealth University's nearby Medical College Hospital to prepare a response strategy.

Having already learned what was in the tanker from the injured driver, the emergency room team called on the university's Office of Environmental Health and Safety (OEHS) for information about treatment and cleanup procedures for perchloroethylene. Among the sources on which the OEHS staff relies is Occupational Health Services, Inc.'s Hazardline on-line data base, which offers subscribers information on 2,400 hazardous substances.

"When we accessed Hazardline through our [Hewlett-Packard Co.] HP 2621 terminal, we were able to determine the acceptable exposure levels and the respiratory protection

and safety gear the Hit Team would need to handle the situation," said Robert Walter, an OEHS bio-safety specialist. "The data base also mapped out the requirements for reporting the spill and the proper cleanup methods."

Relying on the Hazardline information, the Hit Team responded to secure the accident scene, supervising the cleanup and the removal of the remaining perchloroethylene. "That system gave us the ability to determine whether or not we had the resources to handle the spill," Dawson said. "We knew exactly what protective equipment to employ, and we were able to clear the

whole scene in just 20 hours. We were tickled to death, because something like this could have lasted for days."

In addition, the medical college staff isolated a portion of the emergency room, on the basis of Hazardline data, to deal with victims of chemical poisoning. According to Dawson, about 15 state troopers and highway workers who had arrived at the scene before the Hit Team were transported to the hospital suffering from symptoms of perchloroethylene exposure. All were treated and released.

"In preparing for a chemical emergency like this," Dawson explained, "we try to have at least two sources of information to plan a strategy. This computer-based system is an extremely important tool because it is updated daily. I feel it is the latest information you can get about a hazardous chemical. We also use several written reference works, but once you've spent a hundred dollars on one of these books, it's already out of date."

"This system is very helpful," OEHS' Walter said. "It allows us to access this information rapidly in an emergency without having to leave the office. It gives us up-to-date, basic material on a wide range of dangerous chemicals."

## WCGA Names Kroell Assistant

WASHINGTON, D.C. — James H. Kroell has been named assistant to the president of the World Computer Graphics Association, Inc. (WCGA).

Kroell was director of conferences at the American Federation of Information Processing Societies, Inc. (Afiips), where he was responsible for the annual National Computer Conference and the annual Office Automation Conference.

Prior to his association with Afiips, Kroell was staff director of professional services at the American Institute of Chemical Engineers, where he directed the institute's international conference and exhibition activities. Kroell is a graduate of Marquette University's School of Business Administration.

Along with the National Computer Graphics Association, the WCGA is a sponsor of the annual Defense Computers-Graphics in the Building Process conference, scheduled for San Francisco in August. The WCGA can be reached at Suite 399, 2033 M St. N.W., Washington, D.C. 20036.



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## System Helps Game Maker Make Leap From Board To Video Game Market

BEVERLY, Mass. — While its main claim to fame may lie in producing games for the consumer market, Parker Brothers Co., does not believe in playing games in its development labs. As such, the firm uses a mainframe computer to help its traditional board-based games make the electronic jump to microcomputers.

The developer of the famed Monopoly board game is currently marketing its first series of games for home computers. In fact, the firm expects to sell 50 million games cartridges by year-end, making a sizable impact on the \$900 million personal computer software market.

In December 1980, Parker Brothers started predevelopment efforts to enter the highly volatile video game software market. Predevelopment lasted until August 1981, when the software engineering staff began to program games using a Digital Equipment Corp. PDP-11/44 minicomputer. Equipping each programmer with a personal computer was considered, but it was decided that time-sharing on a minicomputer would be more effective. Using a mini would allow the firm to store highly confidential data in one place on hard disks, with data accessible only to the right people. Added to this, the Parker Brothers staff was familiar with DEC computers because it had used them previously.

"We knew from experience that the PDP-11's RSTS operating system was friendly. Its software capabilities included assembly and cross-assembly languages, which we needed to be able to take programs written on the minicomputer and download them into the emulator," said Don-

ald C. Miffitt, director of electronic engineering.

Software development on the PDP-11/44 was a "problematic" success. Parker Brothers had hoped to use the minicomputer for five years. However, it took only five months to exceed its capacity. More horsepower was needed for the game maker's growing programming staff.

A range of options was considered: a network of PDP-11/44s, a larger PDP-11, DEC's VAX-11 line, the Decsystem-20 mainframes and systems from several other vendors. However, DEC computers were found to be comparable in price and performance to those of other vendors. The field was narrowed down to two contenders: VAX-11 and Decsystem-2060.

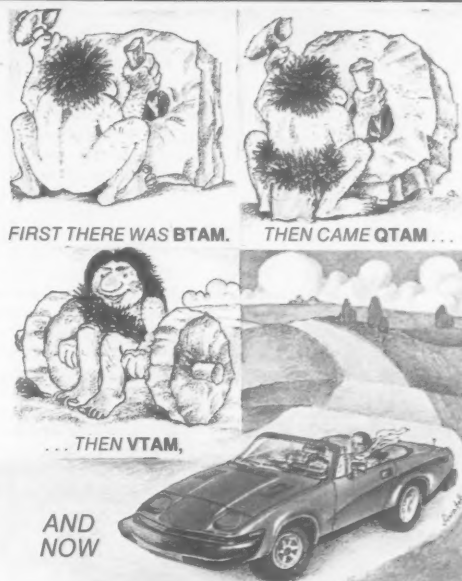
Two considerations tilted the scales toward the Decsystem-2060: an easier conversion from the PDP-11/44 to the 2060 than to the VAX-11 and the ability of a Decsystem-2060 to support more users than a VAX-11. The Decsystem's operating system, Tops-20, is also mature and powerful and provides a large, friendly time-sharing environment, Miffitt said.

The Decsystem-2060 was acquired in October 1982. The conversion effort took several weeks. Although software development was transferred to the 2060, the PDP-11/44 was retained for real-time applications for hardware development and for simulating filters, hardware and analog and digital signals.

The Decsystem-2060 supports a large number of terminals, both hard-wired and connected by dial-up telephone lines to users' homes. The mainframe provides the power required to support the Emax editor, assemblers and cross-assemblers (all of which demand much CPU time). In spite of the work load, the system has continued to provide excellent response time. "Uptime has been phenomenal," Miffitt said.

The Decsystem-2060's architecture, size and operating system have provided the game maker with a range of benefits. For example, the system is user friendly and includes a "?" prompt key that a perplexed user can hit to bring up a list of possible commands. Large-scale storage capacity lets users keep on-line listings of games and game codes. Electronic mail has enhanced communications, and Parker Brothers' secretaries use the 2060 for word processing.

Using a mainframe for software development has, in effect, removed all the usual boundaries faced by programmers, the engineering executive said. "We seldom have to say no to our people. Our staff feels that its productivity and effectiveness have increased since our acquisition of the mainframe. Given the extremely competitive market we are in, we need tools that heighten the productivity and creativity of our staff. Of all the tools at our disposal, the Decsystem-2060 continues to play the most central role," Miffitt said.



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- **BIS-3270, BIS-3780, and BIS-HASP**, for bisynchronous communications. These packages provide the most complete terminal emulation across any protocol environment. Standard features include user initialization module, error checking, hardware diagnostics, and line trace.
- **SNA communications software** which supports SNA/SDLC communications between microcomputers and IBM or IBM plug-compatible host systems. The microcomputer can communicate over point-to-point or multi-point telephone lines with host systems that support IBM 3274, 3278 or 3276 devices. With full screen and keyboard emulation of the 3270 terminal you get local print key support, real or logical, 3284, 3286 or 3287 printer support and a send file capability which permits off-line data entry of 3270 records and subsequent transmission on an automatic or semi-automatic basis.

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MicroTAM products are brought to you by Micro-Integration, Inc. and IE Systems, Inc. the team that gave IBM its bisync 3270 emulator. Building on years of experience in both microcomputer technology and data communications, we now offer a single source of micro-to-micro/mini/mainframe capability for every alternative connection strategy.

27 micro manufacturers are currently committed to offering the MicroTAM family of products as participants in the MicroTAM logo plan. We have also adapted MicroTAM products for a wide variety of other micros. Such adaptations are available directly from IE Systems.

**Learn more about MicroTAM at COMDEX, Booth #3085.**

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## Meet to Cover Maintenance Of Software

MONTEREY, Calif. — Meir M. Lehman and Barry Boehm will speak on "The Laws of Software Maintenance" at the Software Maintenance Workshop, which will be held here Dec. 6-8 at the Naval Postgraduate School.

Lehman, head of the Department of Computing at the Imperial College in London, will update his "Five Constant Laws of Systems Evolution." Boehm, chief engineer of TRW Corp.'s Information Systems Division and author of *Software Engineering Economics*, will address the economic decisions and constraints that drive the software maintenance process into dynamic equilibrium.

Sponsored jointly by the Institute of Electrical and Electronics Engineers (IEEE) Computer Society, the National Bureau of Standards and the Naval Postgraduate School, the conference costs \$115 for IEEE members and \$145 for others. More information is available from the Software Maintenance Workshop, c/o IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

# Package Boosts Programmers' Output at Bank

HARTFORD, Conn. — A large multiservice financial institution here has improved its documentation procedures by acquiring a systems software package designed to aid programmer productivity.

"Up to a few months ago we handled this documentation like most other companies — manually," said Monroe Glover, quality assurance officer for Connecticut National Bank's (CNB) data processing division. "Every programmer would be responsible for documenting all of his changes. This meant a programmer would be spending time writing, editing and proofreading. This cycle would often repeat itself two or three times. Additionally, secretarial support was required for typing. Or worse yet, errors would not be caught and Job Control Language (JCL) would be documented incorrectly."

The bank's IBM 3033, 3083 and 4341 mainframe computers are used to handle teleprocessing and batch processing needs of banking such as demand deposits, retail loans, Master Charge, trust management and investments, as well as system development projects. To meet its growing data processing needs, CNB employs over 80 programmers and plans to hire more in the future. With a staff of this size, CNB found it imperative to keep track of programmer productivity levels and job responsibilities.

"We help our programmers get what they need to use their time efficiently and effectively. We pride ourselves on applying automation wherever appropriate and keep abreast of the latest tools to relieve our programming staff of clerical and administrative functions whenever possible. However, there was one area where we were not accomplishing this goal — system run documentation," Glover said.

## Corporate Mandate

Because of a corporate mandate for data processing to achieve and maintain a high level of efficiency and effectiveness, CNB began a search for a productivity aid for the documentation problem. They eventually purchased a product called JCLflowW, marketed by Consumer Systems, Inc., Downers Grove, Ill.

JCLflow automatically flowcharts systems and provides cross-reference reports using existing JCL as input, thereby relieving the programming staff of tedious documentation requirements. JCLflow accepts job or Proc input as well as instream JCL procedures, retrieves cataloged JCL procedures and data from user libraries, accesses the user's system catalog and maintains a master file of documentation data.

The software solved the problem of decreasing documentation time, relieving programmers of a clerical function. "Productivity in the documentation area is up dramatically since utilizing this product," Glover said. "Now we write the JCL, and JCLflow does the rest automatically."

According to Glover, additional benefits have been realized since using the new system. JCLflow is now used in many areas of the data processing divisions by both technical

and nontechnical personnel. "The biggest plus is in data processing areas that interface with our bank customers, such as data control, operations and customer service," Glover continued. "These areas are staffed by personnel who do not have the same technical background as a programmer. They're not programmers, but they do need to understand job flow. With the new software they are able to become visually aware of the flow of a job by looking at the input and output produced, for example, flowcharts and reports. They get a better awareness of input and output. These people can see from the JCLflow reports the files used to produce the output for their users. Many customer problems are solved on the

spot."

According to Glover, data control and operations personnel have utilized the product in certain problem determination operations. They take an application and a job, input it to JCLflow, which tells them what to do next in a step-by-step procedure. If an abnormal condition occurs, they use JCLflow to find out where the job went down and how to pick up and continue. Instead of getting a programmer involved, they can now solve these types of problems themselves.

Another application of the software by CNB is file maintenance and research. CNB uses the cross-reference reports produced by JCLflow for research purposes. Now that CNB

is involved in many bank mergers and acquisitions, they frequently need to change and update files, as well as merge other files. Therefore, when a demand deposit file requires change, CNB needs to know what jobs could be affected by that change. The programming staff can now set up their tasks and carry them out using the cross-reference reports generated by JCLflow.

CNB has many large application development projects planned in the near future. "We plan to use the system in many phases of our application project life cycle," Glover said. "Because of its flowcharting capabilities and generation of reports, valuable time will be saved at the onset of the project."

## Apollo recognizes the fact that there are two sides to every professional.

There's a part of a professional that involves their profession.



Then there's the part that goes to meetings, makes presentations, does budget, prepares documents.



## Faster Reaction Time Cuts Costs System Helps Airline Manage Assets In-House

MONTREAL — Despite the disadvantages normally associated with self-management, Air Canada has become one of the few firms in North America to manage successfully its assets in-house.

Managers of the \$1.25 billion pension fund, which is the seventh largest employer-sponsored fund in Canada, have introduced a unique computer system that is projected to save an additional \$150,000 annually through improved reaction time to changes in today's volatile financial markets.

"By introducing a fully automated program in-house, the Air Canada fund has gained a much greater de-

gree of vital information on a more timely basis," said Denis J. Groom, senior vice-president of corporate finance and planning.

Fund managers have traded monthly profit and loss statements for up-to-the minute, real-time snapshots, allowing them to determine from day to day the effectiveness of various investment decisions.

### Tracks Settlements

The computer also tracks all settlements and dividends that become due and alerts managers when payments are not made promptly to the fund's account, either by security brokers, banks or trust companies.

Richard Chin, manager of research and investment accounting, said the system includes a Datapoint Corp. 6600 minicomputer with 256K-byte memory, DOS operating system, Datapoint 8220 terminals and two printers. "A difference of one or two days in settlements can mean a loss of hundreds of thousands of dollars annually for a fund as large as ours," Groom said.

By generating daily 30-day forecasts of incoming and outflowing cash, the Air Canada system also allows fund managers to look for investment opportunities to optimize cash on hand.

To maintain the pension fund's se-

curity, the computer monitors which individuals enter particular transactions. A planned extension of this tracking feature, Groom said, will allow individual analysts to identify their own trading activities and measure their investment performance.

### Leapfrog Current Practice

The new system, installed six months ago, has helped the airline pension fund leapfrog beyond the current practice of partial automation. However, even partial automation is relatively new to the pension fund industry.

"A major factor behind this reluctance has been the need for strict privacy and confidentiality," Groom said.

"In order to buy and sell large quantities without major fluctuations in price, it is essential that as few people as possible have access to our trading information," he said. "Small closed systems like the minicomputer can now offer pension funds a degree of security they may not have been assured of achieving through large corporate shared-information systems."

Until several years ago, he said, most pension funds performed administrative activities totally manually, from monthly profit and loss statements to routine accounting entries and calculations of current assets.

"Often, the value of assets and the profit picture was changing even while the ink on the ledger was drying," Groom said. "This made it almost impossible to know how the fund was performing from day to day and to take timely advantage of opportunities."

More recently, larger funds have brought in computer terminals to give investment analysts current prices for securities and commodities.

In addition, portfolio administration has been subcontracted to the banks and trust companies that actually hold the funds' securities.

These institutions provide varying degrees of automated services, such as reports on the maturity dates of securities, monthly statements and daily reports of cash on hand. Generally, however, daily information on current assets, earned income and cash forecasts are unavailable.

The fund has acquired Canadian marketing rights for the program's software and over the next year will begin marketing the system, known presently as the Air Canada Portfolio Management Information System. Chin said the software will be converted to the RMS operating system.

The Air Canada fund has performed well within the industry. Over the last five years, for example, its results have ranked among the very top in the Canadian community.

According to recent reports, people who work with computers spend some 30% of their day working in their chosen profession. And 70% of their day just getting things done.

So we're announcing some ways for making better use of both sides of their day.

For starters, we've set some new standards in high performance workstations. By introducing a new set of Apollo computational nodes so

fast you don't have to wait for them to figure out anything. Even when you're working on Solids Modeling, Image Analysis, Finite Element Analysis, and VLSI Design.

The Apollo DN 660 and DN 460.

Inside you'll find up to 4 MB of main memory. With full 32-bit architecture and an integrated hardware floating point unit. And enough power to handle up to 24 concurrent processes, each with up to 256 MB of virtual address space. Plus high resolution bit map graphics that among other things, can do area

fills at up to 320 million bits per second.

In other words, they've got all the power of a high performance supermini like the VAX\* 11/780. Except that they sit at a desk. And go for a fourth of the price.

But even more important, each DN 660 and 460 workstation node you add to the Apollo DOMAIN network adds power instead of taking it away. Because each is a 32-bit workstation with network wide virtual memory that lets all Apollo nodes share data, software, programs, and peripherals transparently across the network.

But we've also introduced software that helps professionals work with the other side of their work: DOMAIN Professional Support Services. With Document, Mail, Calc, Calendar and File. All based on the more complex needs of the professional. And fully integrated with your application programs. So you can do all your work on the same system.

All of which should come as a very welcome development to every professional. Because we at Apollo are not simply making computers. We're making workstations that work for professionals.

For more information call or write Marketing Services Director, Dept. J1, Apollo Computer, 15 Elizabeth Drive, Chelmsford, Massachusetts 01824 (617) 256-6600, ext. 6608.

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The power of a high-end 32-bit supermini at your desk for a fraction of the price.



The DN 660 and DN 460 can do state-of-the-art Finite Element Analysis at state-of-the-art speed.



They work on documents the way professionals work.



They do Electronic Mail, Filing and Calendar Management.



# OCR Scanner Increases Efficiency at Foundation

OKLAHOMA CITY, Okla. — When the staff at a medical research foundation here decided to modernize its text editing capabilities, the members wanted to be certain of getting good value for their investment. Specifically, they wanted to be sure that the foundation's shared logic system was working efficiently, producing final documents quickly and accurately.

To ensure that the new system was not bogged down with input typing, the Oklahoma Medical Research Foundation acquired an optical character recognition (OCR) page reader that would scan typewritten pages directly into a Lanier Business Products, Inc. word processing system.

Founded in 1946 as a private, nonprofit medical research organization, the

foundation also offers training for scientists in a wide range of areas, including major diseases and basic physiology.

## Staff of 300

Located on the campus of the Oklahoma Health Center, which also contains facilities of the University of Oklahoma College of Medicine, the foundation now has a total of 300 employees, in-

cluding staff members and laboratory personnel.

The OCR scanner has enabled the center's three operators to use their working hours more efficiently. And it has given the foundation's many secretaries, scattered throughout the research facility, access to the power of the word processing stations. Text that the secretaries key on IBM Selectric typewriters at their desks can be entered

directly via the scanner into the word processor without rekeying, a foundation spokesman said.

This capability is a major advantage to the foundation's full-time scientific staff, some 75 Ph.D. and M.D. researchers who write scientific papers, reports and applications for research funds. The scientists work closely with their department secretaries, who understand their writing habits and specialized terminology and can therefore rapidly type drafts of manuscripts and other documents. This is of paramount importance especially when the work is subject to deadlines, as are applications for medical research funds.

To capitalize on the benefits of the OCR/word processor combination, typists and secretaries throughout the complex are asked to originate their material on Selectric typewriters, using a prestige elite font. They can edit the first draft with a red felt-tip pen that will not hinder the operations of the scanner.

## Reading Rate

The Alphaword III scanner from Compuscan, Inc. can read the material at a rate of up to 300 pages per hour, with an accuracy of approximately one error in some 200,000 characters.

Once the material is scanned, it is automatically entered into the word processing system, consisting of a manager's workstation and four terminals. With multiple terminals, the operators can work on different documents or share different aspects of one large project.

After editing and formatting are completed, the material can be stored for later retrieval or distributed in revised letter-quality form via one of three available printers, choosing from a wide variety of print styles.

"With the Alphaword scanner, our Lanier word processor is free to be used for text editing and printing," said Lynne Greene, director of intramural support services for the foundation. "Without the scanner, considerable time would be spent within our Word Processing Center retyping original material on the Lanier system."

"Given the complexity of some of our technical documents," Greene noted, "we sometimes go through several editing cycles on a single piece of work. If the additions are lengthy, we ask the writer to submit them in typed form for scanning by the Alphaword OCR. In the end it saves us a lot of time."



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# Key to Understanding Problem Solving Natural Language Program Gaining Attention

By Patricia Keefe

CW Staff

AUSTIN, Texas — Ever wonder how that whiz in your department figures things out so quickly?

One key to unraveling the mystery of decision-making processes is thought to be natural language programs. Here at the University of Texas, experiments are underway using a natural language-understanding computer program capable of comprehending connected discourse at 5,000 words per minute.

Dubbed Isaac after physicist Sir Isaac Newton, the program was developed in 1975 by Dr. Gordon S. Novak Jr., an assistant professor in the computer science department here. Primarily used to illustrate physics problems, Isaac has received the attention of other scientists because of the program's relevance to studies of the way experts solve problems. Specifically, it offers the potential of codifying the rules that humans use to set up and solve problems — rules that in many cases have defied attempts at verbalization.

## Multiple Sentences

Isaac is one of a few natural language-understanding programs capable of understanding multiple sentences about one topic. Most other programs understand commands sentence by sentence, according to Novak, who suggests Isaac as an illustration of the way computers can be used to aid all intellectual disciplines rather than being limited to numeric calculations. "That's where the big payoff from the computer revolution is going to come," Novak said. "Most of the world's work is nonnumeric. Even for engineers and physicists, computers are not just number processors. They are general symbol processors."

Moreover, "Isaac provides both a model of the processes human subjects use to solve the problems and a theory of how physical representations enter into these processes," according to an article published in *Science* (June 1980) co-authored by Dr. Herbert Simon, a Nobel Prize-winning economist and professor of psychology at Carnegie-Mellon University in Pittsburgh, Pa.

The article noted that a critical component of Isaac is a set of schemata, stored in long-term memory, that the program uses to construct physical representation [graphics], rather than translating syntactically from the natural language text directly into algebraic equations. As a result, the article continued, "Isaac gives us a very specific notion, both concrete and formal, of what the expert's internal representation of physical problems may be like and the schemata that provide the source of his physical intuition."

Isaac can solve about 50 different physics problems of the rigid body statics type, using a core of basic data and tools with which it has been equipped by Dr. Novak. The program is written in Lisp and was originally developed to run on a Control Data Corp. 6600, but has been run on Digital Equipment Corp. Decsystem-20/60s and Hewlett-Packard Co.

desktop HP 98/36s, he said.

An example of a physics problem solved by Isaac is taken from "Schaum's Outline of College Physics" by Frederick Bueche:

"The foot of the ladder rests against the vertical wall and a horizontal floor. The top of the ladder is supported from the wall by a horizontal rope 30 feet long. The ladder is 50 feet long, weighs 100 pounds, with its center of gravity 20 feet from the foot, and a 150-pound man is 10 feet from the top. Determine the tension of the rope." Isaac's rapid answer is 120 pounds.

In creating Isaac, Novak found that "even in ordinary English,

there's a great deal of reading between the lines that people don't realize they are doing." Novak asserted his research shows that an English sentence does not contain the message the sender wants to transmit. Instead, the listener is programmed to create a message out of what he or she already knows.

For example, by the time Isaac understood the meaning of a physics problem, the amount of data involved was found to be 30 to 50 times as much as was involved in the English in which the problem was stated. "This means that English is a very efficient way of transmitting ideas," Novak said. He added that

programs like Isaac need to be coded with many human assumptions to provide better problem-solving modeling. He outlined a problem that involved two people carrying a weight on a pole. Since Isaac was never "taught" that, customarily, people carry weights between them, in solving the problem, it was forced to make a decision that resulted in placing the two figures on one side of the pole and the weight at the other end.

"Teaching a computer common sense is not impossible, but there is a huge amount of knowledge involved," Novak said. "We don't [yet] have a program that can learn the way people can."



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## Calendar

### Week of Dec. 4

Dec. 5-9, San Francisco — **CICS/VS Application Programming.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 5-9, Denver — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 5-9 in Houston.

Dec. 5-9, Las Vegas — **The 24th National Computer Security Seminar and Workshop.** Contact: Education Department, Data Processing Society, Inc., 200 E. Loop 820, Fort Worth, Texas 76112.

Dec. 5-9, Memphis, Tenn. — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-9, Denver — **Advanced Systems Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-9, Washington, D.C. — **Ada Software Engineering.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 5-9, San Francisco — **Financial Modeling: A Structured Approach.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 6, New York — **CICS/VS Management Overview.** Contact: Teltech, 39 Broadway, New York, N.Y. 10006.

Dec. 6, San Francisco — **IMS Concepts and Facilities.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 6-7, Ann Arbor, Mich. — **Data Communications Networks: Planning, Analysis and Design.** Contact: The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

Dec. 6-8, San Francisco — **Personal Computers and Information Networks in a Wired Society.** Contact: Stanford Business Research Foundation, 825 San Antonio Road, Palo Alto, Calif. 94303.

Dec. 6-8, Toronto — **Implementing the Electronic Office.** Contact: ICA Telemanagement, Suite 210, 2175 Sheppard Ave. E., Willowdale, Ont., Canada M2J 1W7.

Dec. 6-8, Toronto — **The Second Annual Conference on Office Technology: Communications in the Electronic Office.** Contact: ICA Telemanagement, Suite 210, 2175 Sheppard Ave. E., Willowdale, Ont., Canada M2J 1W7.

Dec. 6-8, New York — **Advanced Dbase II.** Contact: Center for Advanced Data Processing, Inc., Suite 402,

450 7th Ave., New York, N.Y. 10123.

Dec. 6-8, San Francisco — **Project Management Seminar.** Contact: McCabe and Associates, Inc., Suite 111, Twin Knolls Professional Park, 5501 Twin Knolls Road, Columbia, Md. 21045.

Dec. 6-8, New York — **SAS Basic Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 6-8, Monterey, Calif.

— **Software Maintenance Workshop.** Contact: Software Maintenance Workshop, IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

Dec. 6-8, Andover, Mass. — **Videotex and Teletext.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Dec. 6-8, North Attleboro, Mass. — **RPG-III Structured**

**Programming Course.** Contact: Rick Sweeney, RTC Systems, Inc., 49 Plain St., Box 767, North Attleboro, Mass. 02760.

Dec. 6-8, Dallas — **SAS Applied Time-Series Analysis and Forecasting Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 6-9, Los Angeles — **Computer Network Design and Protocols.** Contact: Ruth

Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Dec. 13-16 in Boston.

Dec. 6-9, St. Louis — **Structured Requirement Definition.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

Dec. 6-9, Washington, D.C. — **Defining Software**

(Continued on Page 80)

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## Calendar

(Continued from Page 79)  
**Requirements.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Dec. 13-16 in Los Angeles.

Dec. 6-8, Arlington, Texas — **Data Communications Concepts and Systems.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Dec. 6-8, Philadelphia — **Screen Design.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Dec. 6-9, Cary, N.C. — **Introduction to Data Processing Using SAS (OS).** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 6-9, Washington, D.C. — **Data Base Management Systems: Mini, Micro and Distributed Applications.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045. Also being held Dec. 13-16 in San Diego.

Dec. 6-9, Washington, D.C. — **Microprocessor Software, Hardware and Interfacing.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Dec. 6-9, Palo Alto, Calif. — **Hands-On Unix Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Dec. 6-9, Boston — **Practical Structured Techniques for Software Design and Coding.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place,

Los Angeles, Calif. 90045. Also being held Dec. 13-16 in Washington, D.C.

Dec. 6-9, Los Angeles — **Hands-On Pascal Workshop.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Dec. 6-9, New York — **CICS/VS Command-Level Programming.** Contact: Teltech, 39 Broadway, New York, N.Y. 10006.

Dec. 6-9, Washington, D.C. — **Distributed Processing: Minicomputer and Microcomputer Implementations.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405. Also being held Dec. 13-16 in Boston.

Dec. 6-15, Culver City, Calif. — **The Fourth-Generation Language Focus.** Contact: Time-Sharing Applications and Consulting Services, Suite 800, 15910 Ventura Blvd., Encino, Calif. 91436.

Dec. 7, New York — **Word Processing With Wordstar.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

Dec. 7, New York — **Making Information Work for You: Using Dbase II.** Contact: Grumman Data Systems Institute, Center for Professional Development, 280 Crossways Park Drive, Woodbury, N.Y. 11797.

Dec. 7-9, New York — **Data Communications I: Basic Concepts.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Dec. 7-9, New York —

**SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 7-9, Denver — **Advanced Communications and Network Engineering.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 7-9, Washington, D.C. — **Financial Information Systems: Integrating Personal Computers.** Contact: National Institute for Management Research, Department PR, P.O. Box 3727, Santa Monica, Calif. 90403.

Dec. 7-9, Boston — **Data Communications.** Contact: Data-Tech Institute, 100 Myrtle Ave., Nutley, N.J. 07110. Also being held Dec. 14-16 in Chicago.

Dec. 7-9, Boston — **Local Area Networks.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

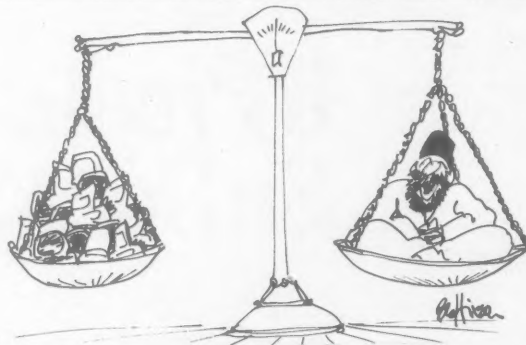
Dec. 7-9, San Francisco — **Generated Business Graphics for Today's Manager.** Contact: Datapro Research Corp., 1805 Underwood

Blvd., Delran, N.J. 08075.

Dec. 7-9, Washington, D.C. — **SNA and Today's Telecommunications Environments.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

Dec. 7-9, San Francisco — **Computer Operations: Effective Network Design.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 7-9, Phoenix — **Network Communications Protocols.** Contact: Center for



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## Calendar

Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Dec. 7-9, San Diego — **The 1983 Association for Computing Machinery Conference on Personal and Small Computers.** Contact: Anne-Marie Claybrook, The Mitre Corp., P.O. Box 208, Bedford, Mass. 01730.

Dec. 7-9, Denver — **Telecommunications Management: Equipment Planning, Selection and Use.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 7-9, Arlington, Va. — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held Dec. 19-21 in Denver.

Dec. 7-9, New Brunswick, N.J. — **Data Communications.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Dec. 12-14 in Boston and Dec. 19-21 in New York.

Dec. 8, New York — **Business Analysis with Multiplan.** Contact: Grumman Data Systems Institute, Center for Professional Development, 280 Crossways Park Drive, Woodbury, N.Y. 11797.

Dec. 8-9, New York — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 8-9, Orlando, Fla. — **Manufacturing Project Management.** Contact: Technology Transfer Society, Department MP, 3420 Kashiwa St., P.O. Box 3608, Torrance, Calif. 90510. Also being held Dec. 12-13 in Washington, D.C., and Dec. 15-16 in Boston.

Dec. 8-9, Dallas — **Enhancing SAS Technical Support Skills (CMS).** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Dec. 8-9, Dallas — **Computer Networks Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 8-9, Orlando, Fla. — **Data Administration: Development and Practice.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Dec. 8-9, Boston — **Data Base Design.** Contact: Q.E.D. Information Sciences, Inc., Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Dec. 8-11, Toronto — **The World of Commodore Show.** Contact: Commodore Business Machines Ltd., 3370

Pharmacy Ave., Agincourt, Ont., Canada M1W 2K4.

Dec. 9, New York — **More Powerful Planning with Lotus 1-2-3.** Contact: Grumman Data Systems Institute, Center for Professional Development, 280 Crossways Park Drive, Woodbury, N.Y. 11797.

Dec. 9, Philadelphia — **Human Factors in Office Automation.** Contact: Q.E.D. Information Sciences, Inc.,

Q.E.D. Plaza, P.O. Box 181, Wellesley, Mass. 02181.

### Week of Dec. 11

Dec. 11-14, San Francisco — **Cause '83: Information Resources and the Individual.** Contact: Cause, 737 29th St., Boulder, Colo. 80303.

Dec. 11-15, San Francisco — **The Fourth Annual Data Training Conference and Expo.** Contact: Data Training, 176 Federal St., Boston,

Mass. 02110.

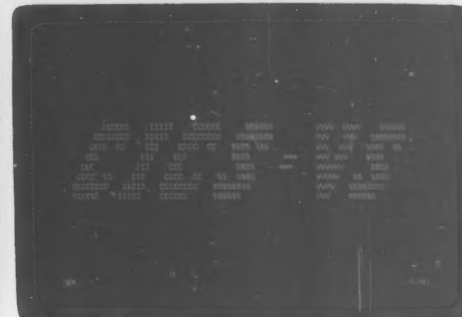
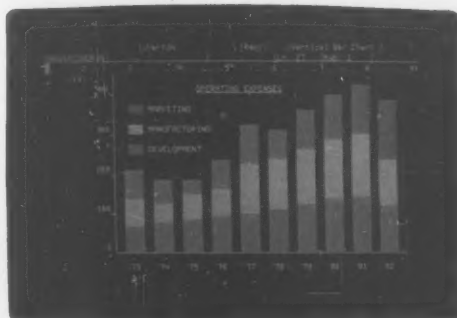
Dec. 12, New York — **Introduction to the IBM Personal Computer.** Contact: Center for Advanced Data Processing, Inc., Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

Dec. 12, Washington, D.C. — **IBM CICS/VS Concepts and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-13, San Francisco — **Integrating External Data Bases With the Corporate MIS.** Contact: Information Industry Association, Suite 400, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

Dec. 12-13, Seattle — **Software: A Legal Briefing for DP Professionals.** Contact: The American Institute for Professional Education, Car-

(Continued on Page 82)



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## Calendar

(Continued from Page 81)  
 negie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Dec. 15-16 in Washington, D.C., and Dec. 21-22 in Fort Lauderdale, Fla.

Dec. 12-13, New York — **International Communications: Products, Technology and Regulation.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

Dec. 12-13, Washington, D.C. — **Focus for the End User: Basic Report Preparation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-13, San Francisco — **CICS/VS Performance and Tuning.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 12-13, New York — **Applications Generators and Fourth-Generation Languages.** Contact: Techtran, 72 Cummings Road, Stamford, Conn. 06940.

Dec. 12-13, Natick, Mass. — **Systems Analysis for DP Professionals and Users.** Contact: Kathy Shaw, Office of Continuing Education/Higgins House, Worcester, Mass. 01609.

Dec. 12-13, Anaheim, Calif. — **Managing Projects in the Structured Environment.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-13, New York — **Application Generators.** Contact: Techtran, 72 Cummings Road, P.O. Box 10212, Stamford, Conn. 06940.

Dec. 12-14, Dallas — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Dec. 12-14 in Washington, D.C.

Dec. 12-14, Philadelphia — **Telecommunications Management: Equipment Planning, Selection and Use.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Philadelphia — **Data Security and Control.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

Dec. 12-14, San Francisco — **Personal Computers: Programming in Basic.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Denver — **Personal Computers: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Los Angeles — **DOS/VSE Internals, De-**

**bugging and Problem Determination.** Contact: Ken Carozza, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

Dec. 12-14, New York — **Successful Use of Minicomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Boston — **Basic System Analysis.** Contact: Yourdon, Inc., 1133 Ave.

of the Americas, New York, N.Y. 10036.

Dec. 12-14, Boston — **Cost-Benefit Analysis.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Gaithersburg, Md. — **Total Systems Reliability Symposium.** Contact: Total Systems Reliability Symposium '83, IEEE Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

Dec. 12-14, Nashua, N.H. — **Project Management and the Personal Computer.** Contact: New Hampshire Center, New Hampshire College, 2500 N. River Road, Manchester, N.H. 03104.

Dec. 12-14, Los Angeles — **Personal Computers: A Hands-On Experience.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Los Angeles —

**Local-Area Networks: Selection Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Washington, D.C. — **Information Systems Modeling, Analysis and Planning.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Washington, D.C. — **Data Base Manage-**

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Dec. 12-14, Houston — **Introduction to Computer Concepts.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-14, Atlanta — **Data Base Management Systems: A Comparative Analysis of General-Purpose Sys-**

**tems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Washington, D.C. — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-14, San Francisco — **Data Administration: Successful Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Del-

ran, N.J. 08075.

Dec. 12-14, San Francisco — **Evaluating, Selecting and Using Computer Software Packages.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Sunnyvale, Calif. — **VM Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Dec. 12-14, Washington, D.C. — **Computer Awareness: Basic Concepts, Capabilities and Terminology.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, New York — **Computer Operations Management.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, San Diego —

**Communications Satellite Systems: A Practical Approach to Implementation.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Dec. 12-14, New York — **DP Project Management: A Practical Approach.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, New York — **Introduction to Office Automation: Concepts, Technology and Applications.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Washington, D.C. — **Improving Office Productivity: Principles and Practices.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-14, Los Angeles — **Systems Analysis and Design: Basic Concepts and Effective Practice.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Dec. 12-15, Fort Lee, N.J. — **Vsam: Its Structure and How to Use it.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 12-15, Los Angeles — **CICS/VS Logic and Debugging.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024. Also being held Dec. 12-15 in Dallas.

Dec. 12-16, Washington, D.C. — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, New York — **CICS/VS Command-Level Programming.** Contact: Teltech, 39 Broadway, New York, N.Y. 10006.

Dec. 12-16, North Attleboro, Mass. — **System/38 Application.** Contact: Rick Sweeney, RTC Systems, Inc., 49 Plain St., North Attleboro, Mass. 02760.

Dec. 12-16, New York — **Introduction to Unix.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y. 10011.

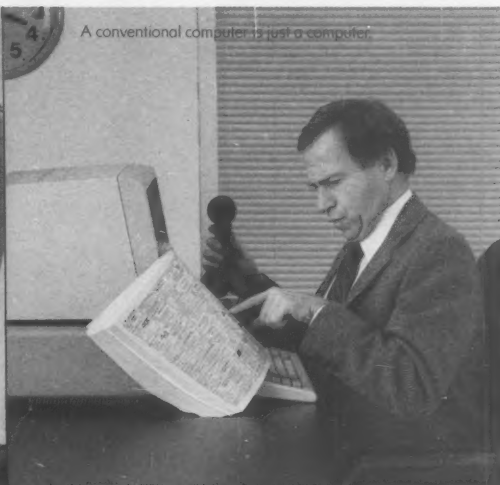
Dec. 12-16, Philadelphia — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 12-16 in Milwaukee, Seattle and Fort Lauderdale, Fla.

Dec. 12-16, Dallas — **Work Load Analysis and Forecasting.** Contact: Insti-

(Continued on Page 84)



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(Continued from Page 83)  
tute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Dec. 12-16, Denver — **Structured Analysis and Systems Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 12-16 in Detroit and Honolulu.

Dec. 12-16, Fort Lee, N.J.

— **CICS/VS Application Programming.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 12-16, New York — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, San Diego — **Modern Communications**

**and Signal Processing.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Dec. 12-16, New York — **Structured Design for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Dec. 12-16 in Dallas.

Dec. 12-16, New York — **Contemporary Computer**

**Auditing: Integrity Controls.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Dec. 12-16, Salt Lake City, Utah — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, New York — **CICS/VS Internals.** Contact: Dianne Halper, On-Line

Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

Dec. 12-16, Sunnyvale, Calif. — **Structured Design and Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, Englewood Cliffs, N.J. — **Software Development Performance Engineering.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Dec. 12-16, Washington, D.C. — **Auditing Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, Chicago — **CICS Command-Level Programming.** Contact: SYS-ED, One Park Ave., New York, N.Y. 10016.

Dec. 12-16, Atlanta — **Project Planning and Control.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Dec. 12-16, Washington, D.C. — **Software Quality Assurance: A Statistical Approach.** Contact: Continuing Engineering Education, George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

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## EDITORIAL

### Think First, Legislate Later

High-technology smuggling today is not as simple a problem as rum-running was during Prohibition. When it comes to computers, the people who "have" must question the "have-nots" not only on their immediate industrial need for a particular machine, but also on its future application. Specifically, the question is whether that machine might someday be turned to the detriment of society, as in a military application.

Recently, West German authorities seized a Digital Equipment Corp. superminicomputer moments before it was to leave that country's jurisdiction on its way to the Soviet Union [CW, Nov. 21]. The DEC supermini is one of many pieces of high technology on a U.S. government-drafted list that are restricted for shipment to Communist countries. The restrictions are necessary, the government says, to protect U.S. technology and to prevent sophisticated computers from being used as military tools.

Unfortunately, the laws against such illegal activities are surprisingly weak. Even the U.S. House of Representatives is backing a bill that would further weaken the already threadbare Export Administration Act that recently expired. The House bill calls for a one-time licensing for multiple exports rather than the current method of approving each individual high-tech export. It would also cut the export administration budget by one-third and reduce the number of customs agents stationed at foreign ports.

We can't help wondering why, if computers and other high-tech items can be used as tools of war when placed in the wrong hands, so many people and organizations disagree with laws restricting computer shipments to foreign nations. Perhaps it is not the eventual use of computers that is the issue, but rather the possession of computer technology itself — an "I have it and you don't" problem.

Simply stated, the rules of the game dictate that if you agree with U.S. policies, you can enjoy the benefits of this country's high technology. If not, then your name is added to the list of have-nots.

There is no question that if a computer is slated to be plugged into a military application — and there is no exact way of knowing whether or not it will be — its shipment should be restricted. Right now, the easiest method for controlling exports is to restrict totally certain technology exports to specific countries.

But blanket restrictions might shut out nations that sincerely want to use computers for the benefit of their people. Further, they tend to stifle the free enterprise spirit of U.S. firms that want to spread their wares into foreign markets.

So before we enact any laws on exports, we must think why these laws are being written in the first place: Is it to stop soldiers from acquiring more high technology? Or is it to use computers as political carrots that are dangled before the heads of foreign states? Either reason has significant arguments in its favor. But they should not be confused in a hodgepodge of senseless overlegislation.



'Brilliant, just brilliant.'

## LETTERS

### Setting the Record Straight

The article "Businessman Gets Brief Sentence for Illegal Exports" [CW, Sept. 19] contains inaccurate and misleading information about our client, Guenther R. Nachtrab of Falls Church, Va.

From the syntax of the article, it is apparent that the U.S. Attorney's Office in the Eastern District of Virginia gave *Computerworld* misleading information about Nachtrab and the lawsuit filed against him in that district. So that the record may be absolutely straight, and Nachtrab's reputation not unfairly blemished anymore than it already is, I'll set forth the facts.

Nachtrab was convicted of nine counts of exporting commodities without first having obtained a valid export license. These commodities had absolutely nothing to do with Soviet Bloc countries, Eastern European countries or military hardware. All counts that alleged that Nachtrab either conspired or actually shipped goods, directly or indirectly, for use by Soviet Bloc countries, were dismissed by the court or acquitted by the jury. Nachtrab was found not guilty, and he was acquitted on every count that alleged shipment, directly or indirectly, to Eastern European countries.

In addition, none of the components in question was designed to military specification. There simply was no evidence of any of this activity by Nachtrab, and the official court record establishes this.

Nachtrab was convicted of failing to obtain a validated export license for the shipment of goods to Vienna, under U.S. Department of Commerce regulations, which require a license where the value of the shipment is in excess of \$500.

Commerce experts testified at the trial that if a license application had

been filed for those nine shipments, those applications would have been granted. Indeed, validated licenses had been granted by Commerce for shipment by Nachtrab to this particular consignee on several occasions. There was nothing about those particular shipments of electrical components other than the fact that they were on the Commodity Control List (not, as *Computerworld* suggested, on an embargo list) and that in the normal course of events, a license was required because of the value of the shipment, not because of the inherent nature of the good.

In fact, the Commerce witness at the trial admitted that each of these components could be shipped individually without a validated license since its individual value was less than \$500.

Nachtrab was convicted of technical violations of the Export Administration Act, and he was acquitted of all counts that suggested by innuendo or alleged that he tried to export goods to Eastern Bloc countries.

Mark H. Tuohey III  
Kirby, Gillick, Schwartz & Tuohey  
Washington, D.C.

### Five-Numeral Digits

I have used a date expressed in five-numeral digits, but not in Julian date form, in a large IMS shop and in an IBM CICS with Vsam shop. The edits and conversion from and to Julian, calendar and this other form of date are contained in a Cobol program for batch and in a Cobol program retrieved via a link in the CICS applications. I have found it to be easier handling date ranges spanning year-ends with this form of date than with Julian dates.

Chris Miller  
Northwest Systems Development  
Crown Zellerbach Corp.  
Portland, Ore.



LECHT ON SCIENCE / Charles P. Lecht

# Software Industry: The Chaos Before Creation

In the larger community of software development houses, companies enjoying special relationships with microsystems manufacturers can be forgiven if their composure begins to slip a bit as they look for omens in Texas Instruments, Inc.'s announcement of the discontinuance of its TI 99/4A home computer. If another major microcomputer hardware company were to fail now, or even radically retrench, its anointed software developers could easily suffer the same fate as that which befell TI's privileged suppliers.

In an industry whose growth has caused nearly everyone, from cottage to corporation level, to be lured into its service by visions of windfall profits, allowing little time for what had once been the normal process of business "digestion" to assert itself in the usual, evolutionary way, the potential for much more widely distributed misery in the event of manufacturer collapse is vastly enlarged. Increased flogging of microcomputer success stories in America's flagship business newspaper, *The Wall Street Journal*, is converting sharpies and dimwits alike to the belief that overnight killings are more than just possible, if only they'll invest in a personal computer of it matters not what kind.

Just as in the case of the many who are stimulated to buy lottery tickets by a willful suspension of disbelief, a generous dollop of greed and the seductive grins of last Tuesday's winner lighting up the good, gray pages of New York's *Daily News*, the odds in favor of getting rich quickly are roughly nil.

The swelling numbers of would-be self-made men who rely upon their microcomputers to deliver their

*'After having been herded into the IBM corral, the software industry appears destined for yet further herdings. The unavailability of larger systems software documentation could corner software companies into seeking their fortunes in IBM's microcomputer marketplace alone; a condition of dangerous overcrowding could then seal their fate.'*

*'Forced into forming from what at that moment appears to them to be an indissoluble bond to IBM's product cosmos, unwittingly concentrating on its Personal Computer family — Poppa PC/XT, Momma PC, Baby PCjr, and their micro in-laws the PC-in-a-3270 and the 370-in-a-PC, and yet others of questionable lineage — they will further weaken the capacity of still-persevering, non-IBM family computer systems companies to gain marketplace credibility for their own product innovations.'*

dreams of glory, taken in conjunction with the fact that the number of viable computer systems manufacturers is markedly decreasing, are impelling the lot to seek out the apparent shelter and security of the IBM-dominated marketplace. PCjr's appearance, after so much palaver on the plausibility of its existence, was like the signal delivered to the remaining microsystems manufacturers by a rifle shot whose message, but not its impact, had been muted by a silencer at the end of the barrel. IBM had fully and finally entered their marketplace, the last one from which it had been notable for its absence.

The PCjr turned out to be no paper tiger; its arrival on the scene meant that the others would find it rough going motivating anyone to invest in software product development for

their systems. The Rubicon does appear to have been crossed; IBM's product momentum is now such that even IBM couldn't stop it — that's why the PCjr's arrival was so awkward.

## The IBM 'Option'

The apparent absence of any current, serious contender for IBM's full marketplace will leave our software companies with little but the IBM "option," if volume is an issue. Micro and minicomputer companies are weakening; Univac Corp. has taken to changing its name; Honeywell, Inc., Burroughs Corp. and NCR Corp. have sought refuge in increased specialization; and Control Data Corp. looks more and more like a service bureau bank. Only AT&T's new (and as yet unproven) information services company seems to pose

a credible, competitive threat.

And after having been herded into the IBM corral, the software industry appears destined for yet further herdings. The unavailability of larger systems software documentation could corner software companies into seeking their fortunes in IBM's microcomputer marketplace alone; a condition of dangerous overcrowding could then seal their fate.

Forced into forming from what at that moment appears to them to be an indissoluble bond to IBM's product cosmos, unwittingly concentrating on its Personal Computer family — Poppa PC/XT, Momma PC, Baby PCjr, and their micro in-laws the PC-in-a-3270 and the 370-in-a-PC, and yet others of questionable lineage — they will further weaken the capacity of still-persevering, non-IBM family computer systems companies to gain marketplace credibility for their own product innovations.

## Survival Options

The survival options of such companies will thus be limited to either specialization on their own or outright acquisition/absorption by an expanding IBM family of companies. Their dispirited software consorts then follow suit or else go under. Swelling competition caused by the swift migration of most software companies into the Blue software marketplace cannot help but propel many of them into an unsought struggle merely to survive. And as the independence of the software development community, including its growing number of software foundations, is thus compromised or sapped, so will IBM's control over the market be enlarged.

(Continued on Page 88)

HUMAN CONNECTION / Jack Stone†

# Micro Market Disarray Confusing Buyers

You don't have to be a DPer to know that the marketplace is swamped with an overwhelming abundance of personal computers and a vast range of software, all of which makes for fascinating conversation.

However, the adrenaline doesn't really start to flow in a serious way until and unless you shop around for a machine that is to be funded from your own pocketbook, rather than from corporate coffers.

In my situation — characterized by an intensive, seemingly unending search for a portable/transportable machine with the power and cost and benefit of an IBM Personal Computer/XL, the weight of the lap model Radio Shack TRS 100 and the price of the Timex Corp. Timex 1000 — the breadth of options, compounded by the apparent impossibilities of fulfillment, has me flustered and confused, if not bewildered.

## IBM Peanut

A friend and systems manager in a large organization leaked to me be-

fore announcement time that the IBM Peanut would be offered in a portable configuration. The day after Peanut was unshelled, I telephoned the local IBM Product Center for information, but the line was busy. I tried again later in the week, but it was still busy — and it's been that way ever since. I guess I'll wait until an IBM salesman calls.

I rather liked the 16K-byte NEC Information Systems, Inc. NEC PC-8200 lap computer, for a while anyway, particularly the \$799 price. A set of applications programs (on cassette) is bundled in; except for one, they aren't terribly exciting to me.

The exception is a print-text formatter that is missing from its read-only memory-based word processing package. But the salesman never answered my request for prices for accessories, especially add-on memory. Later I found out why: A 32K-byte memory module, the minimum size upgrade, would have set me back another \$400, or 50% of the base price. This seemed high to me, particularly because two years ago a 48K-byte

memory replacement for my trusty Digital Research, Inc. CP/M-based Processor Technology Sol 20 was only \$250.

## Incremental Value vs. Investment

Then I looked at the incremental value vs. investment factors. For example, dumping in only another \$400, for a total of \$1,600, would net me a Kaypro, Inc. Kaypro II, which would be a much better buy for the money, in spite of its 8-bit design and tiring 30-odd pounds.

A 64K-byte machine, the Kaypro II is loaded with two 200K-byte drives and the usual complement of software, variations of which are routinely bundled into 8-bit transportables: two word processors and associated spellers, two Basic translators, a file manager, a mailing package, a spreadsheet program and a copy of the CP/M operating system. For only another \$200, a total of \$1,800, I'd get a Kaypro IV with two 400K-byte drives.

An even more smashing value is the new \$400 Kaypro Microsoft, Inc.

MS-DOS memory board upgrade, which endows the machine with a 16-bit capability, some level of compatibility with the IBM Personal Computer and 256K bytes worth of memory that can also be configured into a CP/M random-access memory drive.

Since I would be pushing \$2,200, one could argue a good case for trundling over to the nearest Sears Business Center for the sale-priced Compaq Computer Corp. Compaq (IBM Personal Computer clone), coming in at \$2,700, and about 20 pounds, except that the cost exceeds my budget.

If the truth be known, I'm looking seriously at a clearance-priced Osborne Computer Corp. Osborne I, about \$800 in Washington, D.C. — down from its original price by about \$1,000 — stripping out the \$2,500 (list) worth of software packages, installing the programs on my Sol and then contributing the Osborne hardware to my favorite charity.

Letters to Stone should be addressed to him at P.O. Box 33699, Washington, D.C. 20033.

# The Chaos Before Creation

(Continued from Page 87)

It is tempting to accept the preceding scenario as inevitable, but I, for one, do not. It's hard to believe that IBM would wish this to come about, despite the fact that the more successful IBM's marketing campaign is, the more likely it is to transpire. The increased dependence of software development activity upon IBM product announcements (and IBM's absolute control over products like VM) could, in the extreme, consolidate the computer software industry, from micro to macro, into something so close to a critical mass that a destructive explosion of discontent would become hard to avoid.

Amazingly, retardation of the benefits of continued computer sys-

*"The now-completed synthesis (the rest is a mopping up operation) of the computer and communications industries is diminishing our need to deal directly with computer systems power manufacturing companies. We are now able to tap directly, and more easily, into a reservoir of applications know-how more related to the "know" than to the "how.""*

tems innovation would result; any IBM plan for improved systems involving radically new architectures would expose it to a wave of politically irresistible protest; and each stroke of the design-change pen would draw it closer to a new spate of lawsuits and calls for its regulation

as a de facto public utility. The once-independent software companies would quite naturally have to seek to prevent their collective investments from being transformed from a calculated bid for magnificent downstream profits into so much wastepaper.

This would lead IBM into the proverbial paradox of the "damned if you do, damned if you don't" variety. It goes this way. Its systems will have to be continuously improved, despite potentially heavy losses to its dependents if it is to remain both our national leader and internationally competitive. Nationally, monumental changes to the way computer systems technology is obtained are as close to being realized as are the imminent Integrated Systems Digital Networks.

Internationally, our technology is still high (if not first) on the list of exports contributing to a favorable manufacturing trade balance. It would be ironic, indeed, if our misgivings about a possible acceleration in domestic marketplace shakeout led us to pay too high a price for the perceived benefits of economic, political and technological equilibrium. But this would be the risk we ran if we restrained the forward momentum of our computer industry's development, for we might well then see other nations less sensitive to such questions of internal market balance overtake and race by us.

## Solving the Paradox

Thus, laid out before IBM's leadership would be the debilitating challenge of solving the paradox of dealing with two mutually exclusive, yet coexisting, economic realities. International success would ensure national upheaval; national equilibrium would ensure international catastrophe. For a company whose national and international business is roughly equal, neither scenario is acceptable. And neither will occur.

Our general-purpose computer systems marketplace, now so firmly dominated by IBM, is undergoing rapid change. Its services component is increasing swiftly, and its information component is on the verge of exploding.

Other transformations are under way, too. Users tired of having to vault one technological hurdle after another in order to remain operational are becoming far less interested in acquiring general-purpose tools. With increasing regularity, they are coming to expect "canned" solutions to their business problems. They're tired of programming. New companies are being formed to serve this evolving marketplace; older companies, such as General Electric Co., are experiencing a new vitality; and AT&T's avowed intention to provide everyone else with an alternative source of data processing capability in its Integrated Services Digital Networks is convincing.

The now-completed synthesis (the rest is a mopping up operation) of the computer and communications industries is diminishing our need to deal directly with computer systems power manufacturing companies. We are now able to tap directly, and more easily, into a reservoir of applications know-how more related to the "know" than to the "how." For example, banking and publishing data processing services are becoming available directly through banks and publishers rather than from computer companies. All of these

(Continued on Page 94)

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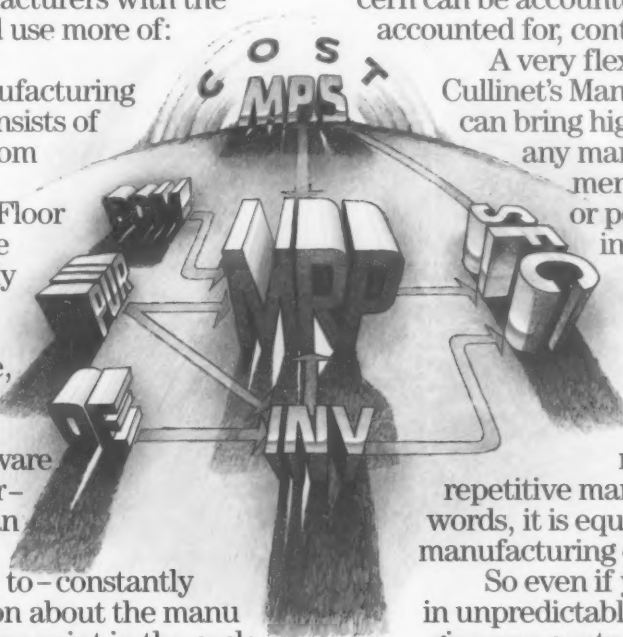
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## READER COMMENTARY/Christine Joseph

# Things to Do When the System Goes Down

If your system has a 98% uptime rate and you are diligent, very hard-working and responsible, then this article is not for you. If, however, your system hiccups, coughs, has frequent schizophrenic fits and enjoys restful afternoon naps, I offer assistance to fill in the empty, boring hours that you might have spent documenting, reading technical journals and otherwise improving your data processing skills:

- Complain about your salary.
- Complain about your manager and how you can do his job better than he can.
- Update your resume.

• Use the lovely squares, circles and other symbols on your template to achieve a masterpiece of high-tech art.

- Call Dial-a-Joke.
- Take the stress test given in any fitness magazine and discover that you checked "yes" to every question, and your cumulative score indicates an imminent breakdown.
- Call Dial-a-Prayer.
- Phone your technical support group and discover (again) the line is still busy.
- Do isometric exercises and hope no one sees you twitch.
- Water the plant on your desk

that looks as though it has had a long, lingering illness.

- Get your eighth cup of coffee.
- Clean out your desk, and remove all old, rotting chocolate chip cookies that are sitting next to your Addidas running shoes.
- Throw out all 224 compiled versions of the same program that you were keeping "just in case."
- Improve your *New York Times* crossword skills after stealing a dictionary from the department secretary.
- Examine the local DP salary survey, and discover what you already know: You're underpaid.

• Examine *Computerworld* position announcements.

- Draw a face on the CRT using X's and Y's.
- Find out all the neat toys you can make with paper clips.
- Reflect on the fact that major drug dealers never have to go through this, and that each owns a Mercedes Benz. Consider a major career change.
- Investigate the cost of opening a fruit-and-vegetable stand on a good corner near your office.
- Do weight-lifting exercises using 5-lb quality assurance manuals.
- Revile the specs of the systems analyst.

• Make paper planes out of the standards manual.

- Denigrate the programming practices of your predecessor.
- Have a good laugh by reading management's idea of a five-year DP plan.

• Construct a Frisbee out of a disk drive.

• Rejoice in the fact that with the system down, you have the perfect excuse for not meeting the deadline you weren't going to meet anyway.

• Break into the snack machine after it eats up your last quarter.

• Crumple the systems analysts' flowcharts into little balls, and then see how many you can toss over your left shoulder into the wastebasket.

• Crucify a systems programmer on a tape drive.

• Condescend to sit with an end user and discover that the eight programs you've spent months working on do not in any way, shape, manner or form produce meaningful results.

• Leave the office, and take a brisk walk in the fall sunshine. Upon your return, discover that the system came up as soon as you left, but is now down again.

• Speculate freely on office romances and designate the recipients of the Mary Cunningham/William Agee Award.

• Dive into the pyramid swamp- ing your "in" box, and uncover all of last year's technical updates.

• Browse through the standards manual, and discover that not one program you've written conforms with those standards.

• Detach some of the pretty, colored wires from inside your terminal, and see if you can put them back together again.

• Reach out and touch someone long distance, using any extension in the department (other than your own).

• Cast *The Wizard of Oz* using members of your department. It should be easy to find those without brains, without hearts and who need courage simply by examining the list of executive officers.

• Cast *Snow White* using members of your department. There is usually a plethora of talent available for the role of Dopey, so compile a list of under studies.

• Compose a *Fantasy Island* script on career pathing in your firm, bearing in mind that there are some miracles even Mr. Roarke cannot per-

(Continued on Page 91)



Trying to solve abends using these hex dumps can really tea a person off.

## The Boston Dump Party.

It was no party trying to solve program abends or cancels using the old-fashioned hex dump. In fact, it was a downright taxing job.

Data Processing Managers used to go around harboring great concern about what effect these unwieldy dumps had on productivity.

Using the old-fashioned hex dump with all the additional manuals, calculations and cross-referencing was a revolting situation. Like taxation without representation.

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## GETTING AHEAD IN DP/Donald J. Berardo

## The Virtues of Imperfection

Imperfection is inevitable. Yet some people waste hours, days and years acting as though perfection is the only condition they can accept. These people don't get much done. Unfortunately, many DP technicians are perfectionists by nature: They want to create the perfect, bugless system.

But there comes a point when further effort is foolish, when trying to make the circle rounder just isn't worth the trouble.

The "80/20 Rule" says you will accomplish 80% of what you should if you concentrate on the 20% of your tasks that are most important. Another form of the 80/20 Rule states that doing something quickly is usually better than spending twice as much time just to complete that last 20%.

In short, take the task to its optimal level of return, and forget about perfection. There always comes a point at which you are doing more work for decreasing value. Knowing how to recognize this optimal point is one of the traits of a good manager.

### An Example

For instance, let's say you're trying to create a system and are looking at the functions you're trying to accomplish. You know that exceptional situations sometimes occur,

and the user tells you that whenever X happens, Y goes wrong. So do you tell your people to find a way to accommodate these situations? Not necessarily, because it may take hours to correct what may be a mere 2% error factor, which could be handled more efficiently manually.

The 80/20 Rule also applies to management functions. Some people spend twice as much time as is necessary writing memos that are more detailed than need be. Some managers get so intent on managing their employees' time that they require them to fill out complicated forms accounting for their workdays. While they

are filling out these forms, they aren't producing anything. The search for perfect time management ends up hurting efficiency.

### Applies at Meetings

The same rule applies at meetings. There comes a time at which the discussion of an issue loses some of its impact. The good manager knows when he has sufficient data to end the meeting and get to other tasks. The manager who feels he cannot make any decisions until every scrap of data has been hashed over won't make many decisions.

When deciding on a vendor, for

instance, you must be able to judge when further research won't reveal much new information.

I'm not saying that thoroughness isn't admirable or that perfection isn't desirable. Nor am I recommending that you work at only 80% efficiency. Rather, working in the marketplace requires speed as well as thoroughness, and it's often more productive to risk imperfection than to insist on absolute perfection.

Berardo is a management counselor and career therapist. He is a vice-president with the Meld Group in West Hartford, Conn., publishers of a monthly newsletter on management development.

## Tips for Filling Downtime Time

(Continued from Page 90)

form.

- Put the Fortran Coloring Book to good use, employing all the blue, red and yellow highlighter pens you stole from the supply cabinet and forgot to take home.

- Create an attractive toy for your cat, dog or gerbil by stapling backup floppy disks together.

- Examine the date on your IBM manuals, and find out that they are six years old.

- Uncover the hidden treasures in the pile beneath your desk. Discard anything that bites you.

- Remove all catsup, salt, pepper and sugar that is over two years old from your work space.

- Remove any small, black wiggling dots from the jar of Coffee Mate.

- Consult your daily horoscope in the newspaper, and discover that new opportunities await. Then call your local headhunter.

- Take your three-piece corduroy suit to the cleaners for its yearly pressing.

- Designate the weakest, wimpiest member of your department "Punk Hunk of the Month," and invite the individual to put a safety pin through his nose.

- Do the exercises in Tom Jackson's *The Perfect Resume*, listing all the accomplishments you could have had if the system were up.

- Write articles for *Computerworld* on "Over 50 Things to Do When the System Is Down."

Joseph is a systems analyst at Software Design Associates in Philadelphia.

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THE DATA CENTER / John P. Murray†

# What Are You Getting for Your MIS Dollars?

Sooner or later it happens (sooner when the economy is not robust): The chief executive officer (CEO), seeing management information systems (MIS) budget requests that continue to rise, asks, "What am I getting for the money I spend on MIS?"

The answer is difficult because so much of the basis for the answer is subjective.

There are rules of thumb that state that for a given industry, the MIS budget should be a certain percent of the organization's sales.

As a relative guideline, such a measurement has some validity. It does not, however, address what I

believe to be the much more critical issue: the value being received for the amount spent.

Given the rapid advances in information processing technology and the ability to do things today that were at least impractical, if not impossible, five years ago, the use of a percent of sales as the only criterion to judge the appropriateness of the MIS budget is not a valid approach.

The critical issue, considering today's information processing technology, should not necessarily be the size of the MIS budget. It should be the question of the value received for that expenditure. Is an installation in

a particular industry whose budget is 1% of sales doing a better job than the installation whose budget is 2% of sales? The answer is, "It depends."

As an example, the MIS manager does some research in attempting to answer the question from the CEO and, using only percent of sales, develops a case that shows that the MIS expenditures for the organization are about right or, perhaps, too low, based upon the industry rule of thumb or the average being spent in other organizations of similar size in like industry.

A third option — "We are spending too much" — has not been ig-

nored. It just seems, as a practical matter, very unlikely that any MIS manager would come to such a conclusion on his own.

## MIS' Contribution

The preceding only measures the MIS expense relative to other organizations. It does not address the more critical issue of the value of the MIS product or the overall contribution MIS is making to the organization.

Issues such as the overall level of MIS service, the effective use of the technology, the removal of obsolete hardware and software, the development of long-range MIS planning and the building of a competent, well-motivated staff all must be considered in order to come to an informed judgment about what you are getting.

Time spent in the consideration and analysis of the value of the work produced by the MIS department in comparison with what is being produced by other installations can prove helpful. These comparisons need not be limited to the specific industry in which the company operates.

The issue should be developed on the broad basis of service and progress, not solely what is being done in our specific industry.

## Effective Comparison

The development of specific criteria that can be used for an effective comparison can prove to be helpful. Some of the items that might be included in such a list are:

- Reduction of the use of obsolete technology.
- Growth and development of staff.
- Development of comprehensive, long-range MIS plans and the effective follow-up on those plans.
- Awareness of, and effort to move to, technically sophisticated approaches that will move the organization ahead.
- Stability of the MIS operation.
- What is the perception of the service level of MIS within the MIS client areas?
- What is the perceived value of MIS to the growth and profit of the organization on the part of senior management?

How can judgments be made about these items? The MIS manager should be sufficiently aware of what is being done in the information processing industry so that some measurements can be developed. Also, the use of consultants should be asked to provide help.

The answer reflects the managerial skills of the MIS manager. If too little is being spent, this study should help the manager to secure additional funding. If too much is being spent, the review should help to develop a course of action to use the MIS resources better.

Murray is director of management information services for Ray-O-Vac Corp., Madison, Wis. He is responsible for worldwide MIS activities. Murray has 21 years of DP experience, 10 of which have been devoted to the management of data centers.

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## READER COMMENTARY /Jerome Garfunkel

# Cobol's Future: Move Toward Fourth Generation

It is interesting that the subtitle of Ken Meyer's, John Piggot's and Rod Grealish's In Depth article "Cobol" is titled "Will the Fourth Generation Reach Cobol?" [CW, Nov. 7].

The answer, to put it quite simply, is that the fourth generation better reach Cobol if Cobol is to survive beyond the current decade.

There are already a number of features in the current Cobol standard that suggest Cobol is indeed evolving into a fourth-generation language. These features include Report Writer, Sort and Search.

But the real evolution of Cobol to the fourth generation is very much symbolized by the Validate facility (and others) that is described in the article.

The acceptance of the Validate facility in the Codasyl Cobol Journal of Development is important not only as a new feature to be added to Cobol (a very important feature I might add), but as an acknowledgment of the immediate future of Cobol while it is being challenged by existing high-level (fourth-generation) languages.

Sitting in the wings for further consideration by the Codasyl Cobol Committee and the American National Standards Institute (Ansi) X3J4 Cobol Committee are other equally significant features that will help Cobol to evolve into the fourth generation of application development languages.

These other features include Update and Analyze, two facilities for handling "routine" file processing and file-matching logic of many application programs; a Data Base facility; a Screen Management facility; Intrinsic Functions; and a Generalized Cobol Macro Generating facility, which will allow users to describe their own high-level syntax to fit any specific application problem.

## High-Level Micro Facilities

If Cobol is to survive as a viable application development tool, it must incorporate all of these high-level macro facilities. If it doesn't, the alternative is clear: Cobol will die a slow death. It will be increasingly ignored in favor of quicker, more efficient, more maintainable languages until the only use for Cobol eventually will be to protect the current inventory of application programs written in Cobol. Once that occurs, it will only be a short time, as application programs go through their nor-

mal life cycles, before Cobol is burnt out entirely.

It is interesting to note that the current controversy over the upcoming Cobol-8X standard is terribly shortsighted. The issue of incompatibilities has so dominated all other issues surrounding the next Cobol standard that, as a result, much attention

that should have been focused on more important issues, such as the speedy introduction to fourth-generation features, has been misdirected.

We have already seen two immediate casualties of this slow standardization process. Both Validate and Intrinsic functions could have

and should have been incorporated into the upcoming Cobol-8X standard. But it now appears likely that they will not.

If Cobol is to survive, we must change the process by which languages evolve. In searching for a solution to this dilemma, the following proposal was formally made

by me to the Ansi/Standards Planning and Requirements Committee /Programming Language Study Group for its consideration.

Programming language development and standardization incorporates (at least) two distinct activities: The first activity is the addition  
(Continued on Page 94)

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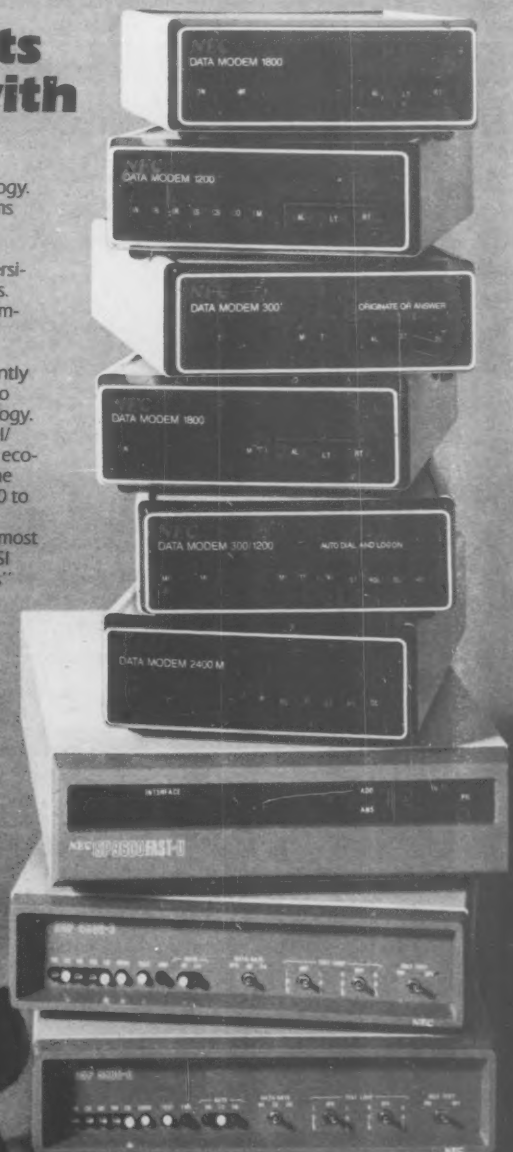
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# Cobol's Move Toward Fourth Generation

(Continued from Page 93)

of new features ("functionality") that, except for new Reserved Words, need not introduce any incompatibilities; the second activity includes changes and deletions which, due to their nature of clearly defining previously ambiguous and undefined (and implementor-defined) features inherently may cause incompatibilities with existing Cobol programs (both ANS standard conforming programs as well as programs using implementor extensions).

## Current Controversy

While the current controversy in the Cobol community is specifically over those features in the later group (potential incompatibilities), a large

*'Assuming the current five-year cycle of language revision (which, of course, is not the true case for Cobol), we can accelerate the pace with which we introduce new, beneficial, productivity-improving features to the language (that is, Data Base facility, Screen Management facility, Validate facility, Intrinsic functions and so on) and do so without causing the furor we have seen over the current Cobol revision.'*

number of very beneficial features in the former group (Evaluate, Reference Modification and so on) are being held up as hostages until the dilemma is resolved.

I suggest that the language devel-

opment/standardization process recognize these two distinct categories of features and establish separate schedules of development work for each.

Assuming the current five-year

cycle of language revision (which, of course, is not the true case for Cobol), we can accelerate the pace with which we introduce new, beneficial, productivity-improving features to the language (that is, Data Base facility, Screen Management facility, Validate facility, Intrinsic functions and so on) and do so without causing the furor we have seen over the current Cobol revision.

I suggest a two-year cycle for these features. Concurrently, we can slow down the clarification process (but certainly not abandon it lest we abandon our charter as an industry standards-making body) so as to give the data processing community more time to assimilate disruptive changes. Perhaps a 10-year cycle is more suitable for this process.

While I recognize that there might be many issues that overlap between the two categories, I am confident that proper guidelines can be described to deal with these issues.

Garfunkel is president of Jerome Garfunkel Associates, Inc., a training consultants firm located in Litchfield, Conn.

## The Chaos Before Creation

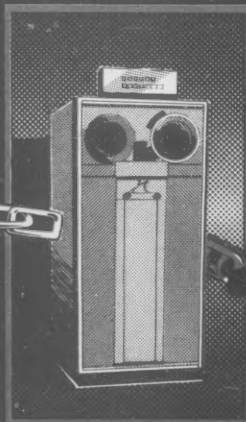
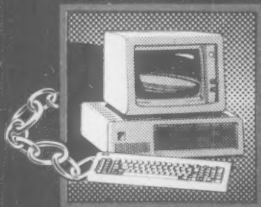
(Continued from Page 88)

real, user-friendly sources will compete for the new marketplace, and all will need software to do so.

As of November 1983, there still reverberates throughout microland a cacophonous paean to America's brawling, bawling spirit of entrepreneurialism, adventurism, optimism and, perhaps, even capitalism. There is no more faithful (not to say musical) manifestation of American industry's robust health and inventiveness than in this spirit. New opportunities are opening to the software community as a result of the swiftly metamorphosing marketplace. It need only survive long enough to take advantage of them.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

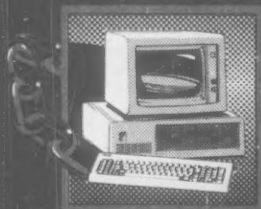
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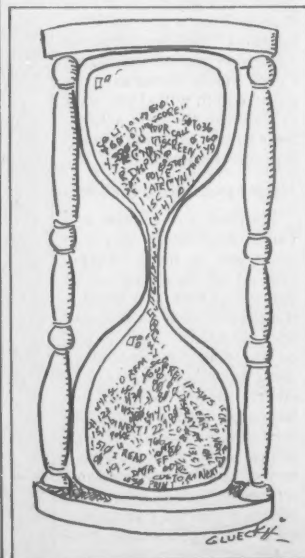
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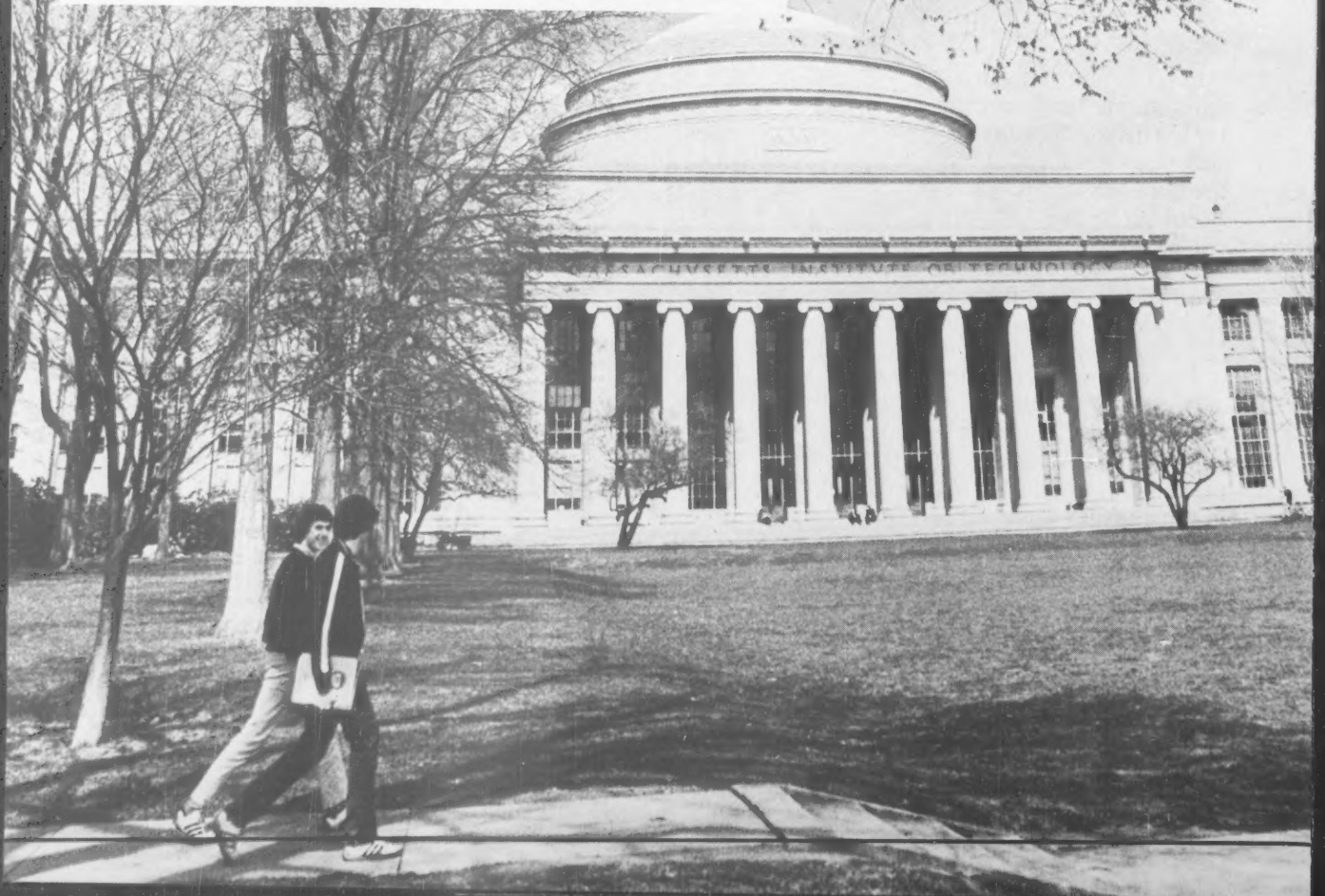
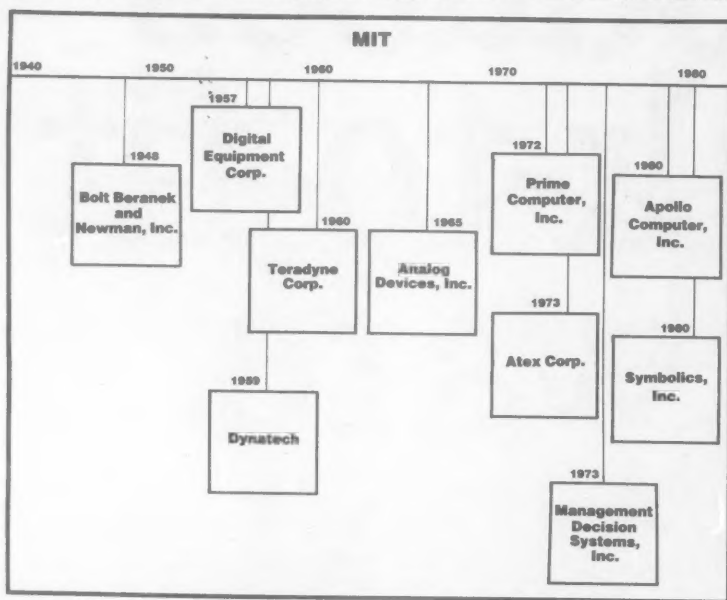
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## From the Halls of MIT

# ENTREPRENEURS

By Katherine Hafner  
CW Staff

At 35, Jay Wurts is a pioneer. By the time he graduated from MIT with a bachelor's degree in electrical engineering, he was already selling a complex decision support system out of his basement to Fortune 500 companies.

Today the sandy-haired, blue-eyed president of Management Decision Systems, Inc. (MDS), who learned Fortran as a freshman in order to find a good summer job, sits at the helm of a company that boasts \$25 million in annual sales, 250 employees and 90,000 square feet of office space atop a hill overlooking Rt. 128 in Waltham, Mass.

The company's mainstay is Express, an integrated software package developed by Wurts when he was only 19 years old. When MDS was formed by two MIT Sloan School of Management professors in 1970, Wurts joined the company as its first full-time employee. By 1973, the market had grown to fit the product, and today the company is expanding at an an-

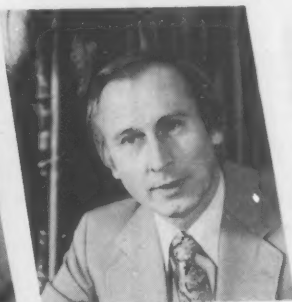
nual rate of 35%.

MDS is one of thousands of young companies that sprang from the halls of academe. Harvard, Northeastern, Boston University and dozens of other schools within a 15-mile radius of each other have all played their part in the creation of the technological ring that is Rt. 128. But as the circle continues to expand, none has been as consistent through the years in its contribution to high-tech enterprise as MIT.

Stanford University in Palo Alto, Calif., is generally considered to be MIT's West Coast counterpart, having exerted its own great influence on Silicon Valley. Starting with Fred Terman, a Stanford professor, and the invention of the transistor by William Shockley in 1947, Silicon Valley has mushroomed into its own city-state of technological innovation. Both institutions foster a distinct synergism between education and industry, MIT perhaps taking the more active role



**Russell Nofsther**  
President  
Symbolics, Inc.



**Ray Stata**  
President  
Analog Devices, Inc.



**Jay Wurts**  
President  
Management Decision  
Systems, Inc.



**Charles Ying**  
Co-founder  
Atex Corp.

Photo by R. Marni

Photo by Calvin Campbell

through an unabashedly commercial thrust. With a style and grace all its own, MIT has cultivated a special student — one perhaps lacking in the well-roundedness so highly touted elsewhere, yet possessing extraordinary intelligence and raw drive. MIT students are encouraged to pursue narrower fields of interest by similarly motivated professors. So a new generation of professionals has been born: impressively competent entrepreneurs whose brainstorms have touched the lives of millions.

"Historically, every MIT president

has stated publicly that MIT has an obligation over and above teaching to help graduates take jobs and go out into the marketplace," commented Richard Morse, an early innovator in high-vacuum technology and former lecturer at MIT's Sloan School.

"In almost every case [of Boston area entrepreneurship], there's probably somebody who has either taken a course or graduated from MIT," agreed John Shane, a general partner at the Palmer Organization, a venture capital firm in Boston. "It's pretty hard to miss the place."

Short of cruising the length of Rt. 128 and the northern section of Rt. 495, it is almost impossible to chart the genealogy of the computer companies on Boston's periphery. It is generally agreed that MIT spin-off organizations number in the hundreds, but the institute itself maintains no count of the alumni, faculty and staff who have started their own computer companies.

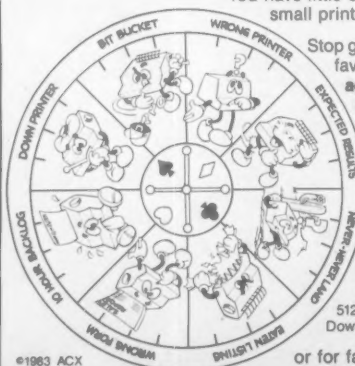
As one seasoned entrepreneur noted, some 10,000 MIT graduates currently live in the greater Boston area. The institute grants 2,500 degrees every year, nearly half of them in engineering.

Intensifying the difficulty of investigating the high-tech compound residing on "America's Technology Highway" is the fantastic amount of convoluted cross-pollination that has taken place ever since the end of World War II, when scores of MIT scientists were cut loose from military labs to form independent companies.

Perhaps most successful of all the MIT offspring who foresaw the profit to be had in computers is Kenneth H. Olsen, a former engineer at MIT's Lincoln Laboratory who founded Digital Equipment Corp. in 1957. To this day, many of Olsen's top managers at the \$4.3 billion company once worked at MIT.

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## IN DEPTH

Olsen, who is still DEC's president, is perhaps an exception to the more general rule of floating entrepreneurship among MIT people.

"It's the rare person who's good at every stage of handling a corporation's maturity," commented David Ness, an MIT graduate who taught at the Sloan School for 12 years. "The guys who start it are usually so lousy at running it, they move from one to another to another, turning start-ups into a success."

Consider, for instance, the brains behind Apollo Computer, Inc., a three-year-old manufacturer of 32-bit scientific processor/workstations based in Chelmsford, Mass., which last month added two new systems to its product line, along with a host of software. Apollo's founder, Dr. J. William Poduska, had eight years earlier founded Prime Computer, Inc. in Natick, Mass. Before that, the MIT graduate worked at Honeywell, Inc.

"Poduska was the junior guy in the computer center when I knew him in 1958," Ness recounted. "Poduska was notorious for being one of the best programmers. He used to pull really clever stuff."

His job at Honeywell was a direct result of work done as chief of the National Aeronautics and Space Administration's Man-Computer Systems Branch at the Nasa Electronics Research Center in Cambridge, where he had developed an operating system for use with Honeywell minicomputers.

And then there is Atex, Inc., whose founders, still in their 30s, now invest in other start-ups. In 1973, Charles and Richard Ying, brothers who attended MIT as undergraduates, developed an efficient method for text processing in an unheated loft in Lexington, Mass. Charles developed the hardware, based around a DEC PDP-11 minicomputer, and Richard wrote the code for the system.

According to Charles, who grew up in Hong Kong and attended a private school in Switzerland, he and Richard applied to MIT because it was one of the few American schools that waived the application fee for foreigners.

"We didn't know what MIT was," Charles said. "I just told Richard there was a school that didn't cost anything to apply to. We took the college boards and never even completed our application forms."

One of the first major undertakings for the company was to decide on a name. They set aside a day and filled a blackboard with possibilities based on the word "Lexington."

"We consulted friends with gray hair in the business community about the guidelines for picking a name. They said to keep it down to two syllables and start with an 'A' because at a trade show with alphabetical listings, people see it first. Finally the board got filled up and Atex was at the bottom of the board, so we said, 'That's it.'"

With "some great ideas" but nothing

***It's the rare person who's good at every stage of handling a corporation's maturity. The guys who start it are usually so lousy at running it, they move from one to another to another, turning start-ups into a success.'***

so concrete as a product to sell, they teamed up with Douglas Drane, a Harvard MBA, and set out to convince major publications whose writers were not only loath to give up

their typewriters, but downright hostile toward computers, that Atex's idea for real-time composition was something to invest in.

In November 1973, having pooled

\$2,700 in cash, they received their first order from *U.S. News & World Report*. With an advance of \$100,000, they worked night and day to meet an initial deadline of mid-January designing the prototype for the system.

"They gave us the order on Thanksgiving Day of 1973. By the first week of January, we had to have a multiterminal system designed, working and editing with H&J (the ability to hyphenate and justify). We didn't even know what H&J was," he laughed. "I remember calling Doug

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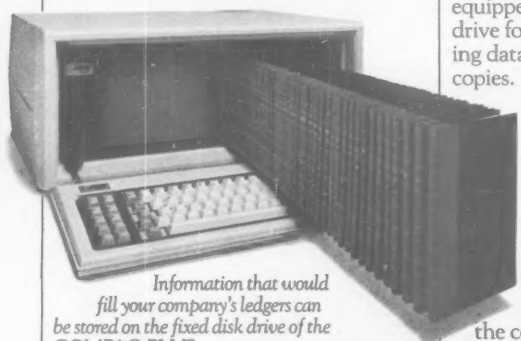
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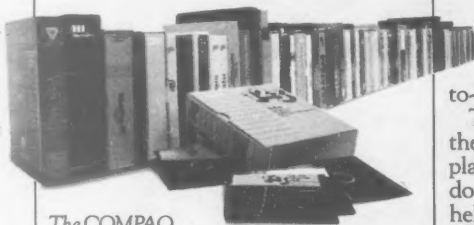
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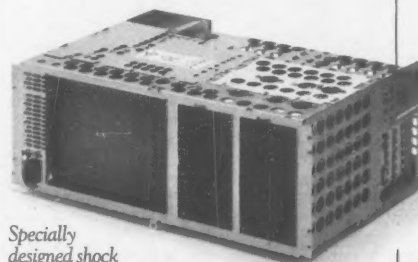
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*The COMPAQ PLUS runs all the popular programs written for the IBM Personal Computer XT.*

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## IN DEPTH

on New Year's Eve. He's a Notre Dame grad and he was watching the [football] game. He said, 'I'd love to stay here and give you moral support, Charlie, but I've got to watch the game.'

"It wasn't a matter of how many hours we worked [to

meet that deadline]," Charles said, "but how many hours of sleep we managed to squeeze in."

After convincing *U.S. News & World Report* essentially to underwrite the idea, "for the first time I appreciated the salesperson's job,"

Charles recalled. "You go in and talk for an hour and come out and have accomplished nothing."

Today, the Bedford, Mass.-based company, which was acquired by the Eastman Kodak Co. in 1981, supplies text processing systems to *The*

*Boston Globe*, *The Christian Science Monitor*, *Newsweek* and *Reader's Digest*. When Kodak bought the company, the Yings and Drane profited handsomely, each receiving enough Kodak stock to retire before age 40.

Charles, 37, now splits his

time between Seattle and Silicon Valley, investing in "young, deserving" start-ups with the same potential Atex had 10 years ago. Richard spends the bulk of his days on the road, investigating new prospects for investment with Charles.

As humble a millionaire as you'll meet, Charles refuses to acknowledge that he might have been accepted to MIT on his own merits. "Maybe someone in admissions said, 'We've got two applicants from Hong Kong living in Switzerland. What's our quota for that?' And someone else said, 'Two.'"

While it is generally agreed that MIT is in large measure responsible for the proliferation of high-tech companies along the Rt. 128 corridor, pinning down precisely why it is that MIT produces so much entrepreneurial wherewithal is another matter.

More than any other place in the country, MIT encourages [entrepreneurship]," suggested Edward Roberts, a Sloan School professor who has closely followed the growth of companies along Rt. 128 and their relationship to the academic setting. "Unlike Harvard and Yale, where commerce and outside consulting are said to be detrimental, tearing apart at the fabric of the institution, MIT has no written policy, but there exists a long tradition in support of entrepreneurship here," Roberts said.

"Essentially, MIT is a strong institution that sticks to its knitting. The best places stick to their knitting. Whatever you do to a university, the principal thrust of the faculty is education and research, not outside commercial interests."

But there are those who disagree with Roberts' view of the MIT faculty and its role in Boston's industrial base. The Palmer Organization's Shane, who has had a hand in some 150 start-ups since he started in the venture capital business in 1946, sees open and deliberate encouragement at MIT for graduates to strike out into the commercial world, with faculty members as role models. "The faculty does a great deal of consulting. The idea of encouraging and stimulating new ventures is an important factor in making MIT such an important contributor. The institute has always tended to be quite liberal in what people could do. Students could work part-time, or the faculty

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## IN DEPTH

could. At one time you could actually find industrial companies with phone extensions at MIT."

Shane points to a host of disparate elements in the greater Boston area that add up to create the necessary ingredients for commercial success among MIT graduates. "It's a combination of the university, the cultural and geographic uniqueness of Boston," he said. "All those things reinforce one another."

Yet another opinion is put forth by the Wharton School's Ness. "I think a major contributor to MIT's success is Boston traffic jams," he said. "In Minneapolis, everybody goes home at 4:30. At MIT, you wait until the traffic has subsided and you go have a beer at the faculty club and discuss ideas."

Perhaps part of the MIT spirit is captured in MDS' Wurts, whose relationship to his schooling was practically rather than academically oriented. By his sophomore year, the self-assured Wurts was already deeply entrenched in his own consulting practice, developing marketing models for large organizations.

"I'm convinced that I had the best undergraduate education of almost anyone I know," Wurts said. Although he was too busy with his business to attend many classes, the



Management Decision Systems Headquarters in Waltham, Mass.

lectures he did attend were helpful in giving him ideas for work.

"Sometimes understanding the problem is harder than understanding the solution," Wurts said. "The other students were still struggling with defining problems. In my consulting, I knew what the problems were because I was faced with them every day and didn't have to conceptualize them in a classroom. The courses I took helped me with solutions to the problems."

When Wurts dropped his consult-

ing practice to form MDS, he took an \$8,000 pay cut. "I was making \$12,000 when I first started at MDS," he said.

But if Wurts had any apprehensions about the prospects for success, to this day he doesn't let on. "I thought we'd be this successful after two years," he said.

"Entrepreneurs are eternally optimistic," commented Jeff Stamens, 38, senior vice-president at MDS and also an MIT graduate who has started his own share of businesses, typify-

ing the floating entrepreneur. "A new company starts out being worth a billion dollars and the value goes down from there."

Wurts is, however, one of the first to acknowledge that MIT did not prepare him for all of the hurdles associated with starting a company. "At first I thought that just coming up with a good idea was enough," he said. "We were waiting for the wolf to beat a path to the door."

"Then we saw we needed things like documentation, and in 1977 I became convinced that we would never be a truly great company by just being great technically. So I looked at all the technological greats that are also very successful, such as Kodak, IBM and Polaroid, and we began to learn how to market our product."

"At engineering school at MIT, you hear about all the successful companies, but you have no real conception of the marketing world," Charles Ying agreed. "You think if you build a better mousetrap, then soon the whole world will be at your door."

Ray Stata, president of Analog Devices, Inc. in Norwood, Mass., said he learned how to run a company from "the school of hard knocks."

But despite the lack of formal business training available to him at

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## IN DEPTH

MIT, the institute was Stata's first and only choice as an undergraduate. "In electrical engineering, which was the area that interested me, MIT was regarded as the highest ranking school in the country and still is."

Stata is a soft-spoken man of 49 for whom commercial success appears to have been incidental to his work as an engineer. He founded Analog Devices in 1965 "in the boondocks of Cambridge."

Analog Devices manufactures integrated circuits used in data acquisition applications. It also supplies

products ranging from components to subsystems and systems for computerized measurement and control applications.

With no formal business training, Stata created a company that now employs 4,000 people and reports annual sales of \$213 million. Analog's growth plan for the next four years includes hiring some 9,000 new employees worldwide.

### Understanding Products, Markets

"There are more ways to get business training than going to business

school," he said. "The real issues of high-tech companies are the products and the markets and whether or not you understand those issues."

"In 1970, there was a notable lack of professional management experience and knowledge [at Analog Devices]," Stata said. "That's when I took over as president and dedicated myself to learning more about the job of management and leadership. As we grew, those issues became paramount."

For Stata, who is originally from Pennsylvania, MIT had a "magnetic"

effect, and once he finished school, he had no desire to leave the Boston area. "Ten percent of the enrollments at MIT come from Massachusetts, and 36% of the graduates stay here," Stata said.

### Commercial Lure

MIT's knack for attracting talent is commensurate with the lure of commercial opportunity for its students, faculty and staff.

In 1966 Russell Nofstker, a graduate of New Mexico State College, went to MIT to do consulting on artificial intelligence. Soon thereafter, the MIT Artificial Intelligence Laboratory was formed, with Nofstker as manager.

According to Nofstker, now 41 and "one of the oldest in the company," the MIT AI lab was doing things that were "significantly beyond the computer industry. Nothing commercially available came close to serving the needs of AI research."

So it was partly "out of frustration on the technical people's side and because I thought it was a good opportunity" that in April 1980, Nofstker came out of semi-retirement to form Symbolics, Inc., a stone's throw from the MIT AI lab in Cambridge. Using Lisp as its principal language, Symbolics develops, manufactures and markets computer systems with integrated hardware architecture and software designed specifically for symbolic computing.

In stark contrast to the \$500 in savings it took to start MDS, or the Yings' \$6,000 personal investment in Atex, Nofstker solicited such investors as American Research and Development, General Electric Co. and General Instrument, who brought the total equity to \$30 million. Today, Nofstker said, Symbolics ships more than \$3 million in products per month.

Nofstker estimates that 80 Symbolics employees, or nearly 30%, came from MIT. But he scoffs at the suggestion that Symbolics goes so far as to recruit MIT affiliates.

"We only want good people, wherever they come from," he said. "In fact, early on, as we were founding the company, we decided we wanted enough variety that we wouldn't be inbred."

The abundance of talented MIT graduates Nofstker attributes to the institute's willingness to admit applicants who are not entirely well-rounded.

"MIT is unusual in that it not only admits but condones unusual people," Nofstker observed. "That is, people who are not necessarily socially adept, or people who are weak in parts of their academic background. But if they show promise, they can get in. A person might be mediocre in numerous things, but if they're outstanding in one thing, they can make it at MIT."

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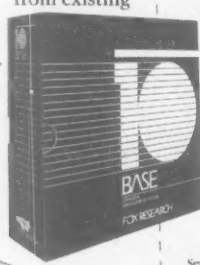
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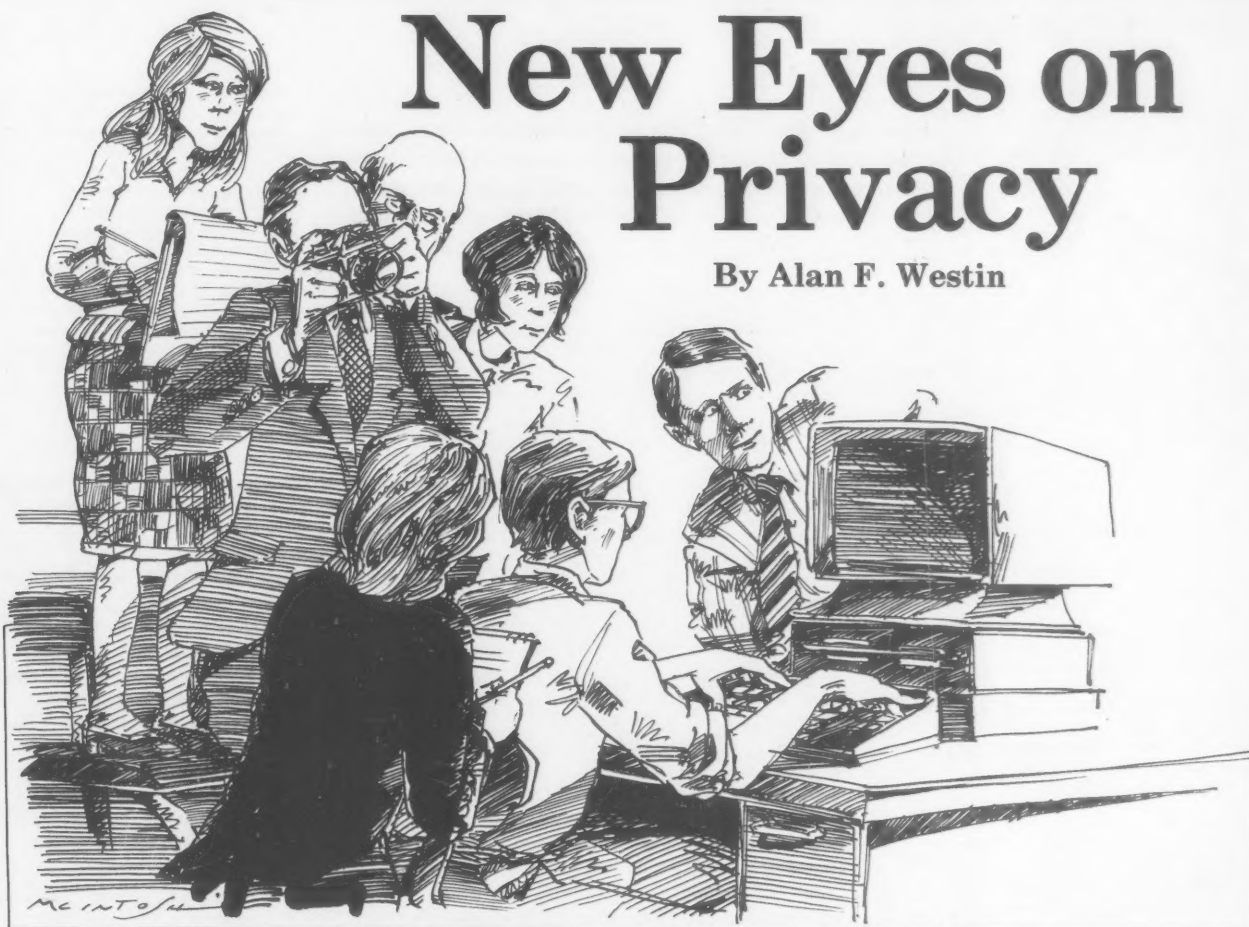
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# New Eyes on Privacy

By Alan F. Westin



Just when most organizations have addressed the issues of privacy and confidentiality in their DP systems and settled down to apply standards to expected, regular changes in the DP environment, a new threat to their sensitive information appears.

This menace isn't another monster shark headed for mainframes and dumb terminals. Nor is it the recently well-publicized threat of "hacker fish" nibbling away at telecommunications links. This time, it is more like a school of deadly little piranha, and their target is the sensitive data accumulating in millions of shiny new micros.

Like placid bathers on the shore, most organizations so far have either failed to see the new problem or are looking at only one facet of it. As part of a national study of the organizational and social impacts of office automation, we recently surveyed about 100 leading-edge users of CRT terminals. Included were the banking, insurance, credit, communica-

tions, manufacturing, utilities and service industries, as well as local, state and federal government agencies and non-profit organizations.

About half of these sites are beginning to adopt security measures to protect sensitive office automation data from outside penetration. But in more than 90% of the organizations, management is not yet addressing the new policy questions as to privacy and confidentiality that are arising as microcomputers are adopted for clerical, customer service, professional and executive activities in the office.

In nine of 10 organizations, we found that management:

- Has not formulated policies specifying what data concerning the performance of individual CRT terminal operators should be collected and how any such records should be used for personnel purposes.
- Has not examined how personal computer record keeping might affect



## IN DEPTH

the organization's compliance with regulatory duties, antitrust laws and other legal mandates.

- Has not defined what information should — and should not — be put into micros by professional and executive end users.

- Is not periodically auditing or even sampling the data that employees and executives are putting into their machines.

- Has not issued confidentiality rules concerning data in electronic mail and message systems and has not issued explanatory literature or held training sessions to acquaint new groups of end users with basic concepts of privacy protection for sensitive information.

Furthermore, in three-fourths of the organizations we examined, neither the DP nor legal departments have communicated to top management the need to develop new office automation privacy and confidentiality policies, though these groups should be the ones to bring such issues to top management's attention.

In short, office automation applications are creating important new privacy-policy issues for management. But, a large majority of organizations are so busy with the hardware and software aspects of OA that they have not begun to take these policy problems seriously.

In principle, office automation calls for many of the same rules of privacy protection that are required when organizations put sensitive personal data into DP systems. During the 1970s, five basic standards for such privacy protection emerged, known as "fair information practices" rules:

1. Information collected and stored about individuals should be limited to what is relevant and necessary to carry out the socially approved functions of the collecting organization.

2. Once collected, such information should be compartmentalized so that only those within the organization who need to know it have access to it.

3. Identified personal information should be released outside the collecting organization only when the subject has agreed to its disclosure or this is required by law.

4. Individuals about whom information is collected and stored should know what is being done, have opportunities to see data that is being kept about them and have a procedure for challenging the accuracy, completeness or proper use of their data. Exceptions to such subject access rights should be rare, only when demanded by a very strong competing circumstance.

5. Organizations must adopt security measures that will enable them to keep their promises of privacy and confidentiality.

These privacy principles became a general norm in American society in the 1970s. Federal or state statutes covered confidentiality regarding federal agency practices, credit reporting, employment and insurance

***In three-fourths of the organizations we examined, neither the DP nor legal departments have communicated to top management the need to develop new office automation privacy and confidentiality policies.***

investigations, law enforcement and medical records. Even in areas where laws were not enacted, hundreds of organizations adopted voluntary codes for handling personal data on

customers, clients, employees, patients and students.

In one sense, office automation trends call for extending these privacy standards from DP into the OA

area, something that most organizations have not yet done. But there are also some important aspects of office automation that are different from the DP environment and may require either new policies or special procedures. Four of these were particularly apparent in our field visits:

1. Professional and executive OA applications are leading to data handling that can violate organizational and legal standards of data privacy. Files in DP systems are created and managed in a centralized organizational ethos. The system cre-

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ators usually think about what data should be put in, who should see it and what regulatory duties or legal exposures may apply. In a return to individualism that is in one sense a great liberating force in organizations — bringing computer power to the end user — personal computers now allow the individual to decide what to put in.

In our site studies, we found end users mixing organizational data, personal data and data from outside sources in ways that absolutely startled the DP staffs who learned of

***In site studies, we found end users mixing organizational data, personal data and data from outside sources in ways that absolutely startled the DP staffs. Such activity can directly violate the organization's policies or legal duties regarding treatment of sensitive information.***

such uses during our visits. Such activity can directly violate the organization's policies or legal duties regarding treatment of sensitive data.

2. OA information is being handled by end users who do not understand principles of information sensitivity. In the 1970s, perhaps

10% of the personnel in large organizations used terminals directly for their jobs; these were mostly DP professionals, closely supervised data entry clerks and a few staff or executive people in end-user departments. Now, between 25% and 40% of white-collar employees in these organizations are using terminals, predominantly for word processing, customer service and professional tasks. Estimates are that 80% of white-collar employees may be using terminals directly by the end of the 1980s.

What distinguishes these new users, whether clerical or executive, is that they have not been prepared by their professional backgrounds or by organizational instruction to understand information sensitivity, confidentiality principles or security techniques. They are like untrained recruits playing with live information ammunition.

3. Information in OA files is often more finished, refined and sensitive than DP data. As Robert Campbell, president of Advanced Information Management, points out, "Data in mainframes is usually raw — statistics, stocks, flows and so on. But information in word processors, micros and other office systems being used by management and often handled by secretaries is end-state information — full of sensitive organizational judgments about people, events and plans. It is potentially much more valuable to someone who is not supposed to see it, whether inside or outside the organization. Per ounce of information, it is much more sensitive than mainframe data."

4. OA creates new channels of information communication and distribution that can upset important confidentiality relationships. When written documents with confidential information are generated, someone — the author, the secretary, the meeting reporter — usually thinks about those to whom this particular item should be sent. Similarly, in DP systems, distribution and access channels are set by policy, usually with confidentiality interests well considered.

When micros are hooked into an organization's existing data system, however, and especially when electronic message systems are created, end users can suddenly send sensitive information all around the organization — jumping levels in the chain of command and crossing unit boundaries. Message senders start distributing data to people who ought not to get particular memos or reports, wrong distribution codes are inserted and sometimes distribution is left in the hands of word processing operators who do not know which information is confidential in relationship to which organizational member or unit.

When naive end users are plugged into message systems in organizations that have issued no guidelines to cover this activity, confidentiality breaches inevitably happen.



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With regard to these new vulnerabilities, we found two clusters of problems developing in the organizations we visited.

**1. Client and customer files.** Many organizations have advertised to their potential and existing customers a code of privacy or fair information practices, including what information is collected and stored about them and how a customer can inspect such data if he wishes. This code applies to bank and investment accounts, insurance files, credit-card accounts and health records. The same applies to state and federal agencies operating under fair information practices laws. Where organizations use primarily manual forms or input data to centralized DP systems, they have set rules for compliance with such policies by their employees.

With personal computers, however, loan officers are now creating their own files on prospective customers. Salespeople are opening up personal files on prospects. Purchasing agents are creating personal files on suppliers. Government employees can create personal files on welfare or social services clients or taxpayers. These users do not seem to appreciate the applicability of the manual file/DP file policies to their micro-file conduct.

To some extent, the micro uses we observed were the equivalent of the old "desk files" that organizational personnel used to keep and which are sometimes permitted under privacy rules as "temporary" and "tentative" records, not used to make "organizational" decisions. But we found that such records kept in micros tend to be stored without any destruction cycle and frequently include speculative and sensitive information or evaluative remarks that could violate customer privacy laws or organizational rules. Their presence could be highly embarrassing to top management if they were subpoenaed in a lawsuit.

Similarly, when management is unaware of what some employees have put into their micros, a customer might not be provided access to "all the data about him," producing potential legal liability for the organization. Similarly, the creation of OA message and mail systems can breach confidentiality rules regarding who within the organization is to see various kinds of sensitive client or customer data.

In one large financial services firm we visited, a middle manager commented: "I am responsible for seeing that we comply with federal and state privacy and consumer protection laws, equal credit opportunity laws and fair credit billing laws. I used to be able to control the flow of communications to be sure that we followed the requirements of those laws. Now, I notice that messages of all kinds are moving around the organization, both those discussing individual decisions and those discussing our policies."

"I don't know how long these are

***Records kept in micros tend to be stored without any destruction cycle and frequently include speculative and sensitive information or evaluative remarks that could violate customer privacy laws or organizational rules.***

kept in any kind of a central memory system or in the terminal of the sender or receiver. We might never have any problem, but it worries me that no one has set up rules for using this

internal communication and message system the way we have for our older DP systems. I wonder what might happen if this got dumped some day as part of a regulatory

agency inquiry or a customer lawsuit."

**2. Employee and personnel issues.** New privacy issues in using OA for personnel work cover a wide range, including: 1) managerial input into micros of observational data that could violate state employee privacy laws or privacy-oriented Equal Employment Opportunity (EEO) regulations; 2) creation of occupational health surveillance systems on medical department micros that may not be known either to employees or to unions (where a firm is unionized);

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3) creation of terminal-based systems for sensitive employee and executive data where this opens up broad confidentiality problems.

On the latter point, for example, one senior personnel executive we interviewed blasted the DP function in his organization (a financial services firm) for "always wanting to make personal data move around faster, putting it into the hands of everyone with a terminal. Just because it's technologically possible to put employee financial, benefits, health and other data on-line doesn't mean

we really need to do that. Having hard copy available through batch processing is all we really need. The 'Mount Everest psychology' of the technologies is a real threat to our privacy policies."

The most widely publicized employee privacy issue in OA stems from the way that office systems make possible a total monitoring of the work done by clerical, secretarial and customer-service employees. OA software can generate records indicating when employees log on, leave their work, return and log out at the

end of their shifts. Records can be produced on the number of keystrokes in a given period, the number of telephone calls taken, the transaction time for each claim processed or customer call handled and the number of errors detected.

Supervisory monitors can then collect such operator data on each employee within each work unit, display it for the supervisor to watch and also issue hourly or daily printouts, creating a detailed record of each operator's performance.

The capacity of employees to mon-

itor without an employee's knowledge or to use the monitoring to apply unfair "speed-up" pressure has been attacked as an invasion of privacy by a broad coalition of critics. These include:

- Women's rights groups such as the National Association of Working Women. Mary Mitchell of the Boston "9 to 5" chapter attacked the use of OA monitoring by which "machines record every keystroke and every pause," with not only raises, but the worker's "very employment" tied to meeting quotas. The situation is like having an electronic foreman watching every move, every minute.

- Unions representing office workers, such as the Newspaper Guild; American Federation of State, County and Municipal Employees; Brotherhood of Railway and Airline Clerks; Communications Workers of America; Office and Professional Employees; Service Workers; United Auto Workers (which represents 100,000 white-collar employees); International Association of Machinists; and many others.

Unions are demanding collective-bargaining clauses that would either forbid automatic monitoring of individual video display terminal operators or require such records to be communicated to the employee, with work quotas set by union-management bargaining.

- Occupational health advocates, such as the Women's Occupational Health Resource Center. These groups attack automatic monitoring as creating an oppressive "assembly line" environment that increases emotional stress for clerical workers, contributes to eyestrain and leads to "alienating" work conditions.

As these complaints have mounted — drawing support from civil liberties groups, church social-action organizations and journalists writing about CRT issues — provisions to forbid employer monitoring of CRT operators have been written into regulation bills introduced in six states last year and are likely to be on the agenda in 15 to 20 states in 1984.

A typical provision, in the Massachusetts "VDT Safeguards Bill," states that "No employer may use a terminal to monitor the productivity of a VDT user on an individual basis."

In addition, warnings to operators that their employers would install "Big Brother Monitoring" have been a feature of unionization campaigns now focused on banks, insurance companies, universities, hospitals and other white-collar-intensive industries. This concern was one highly visible issue in the successful campaign of the Service Employees' International Union to organize the Syracuse, N.Y., claims office of Equitable Life Assurance.

A recent unfair labor practice suit filed against *The New York Times* also illustrates the problems created when management fails to address this issue directly.

The Newspaper Guild has charged the *Times* with installing, unilateral-

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ly, a log-in, log-out telecommunications system in its classified advertising department that the union says is a "Big Brother" attempt to get "complete control" over workers for "every second of the day" and effectuate a "management speedup."

Supervisors will now be able to track every minute of an employee's time, including "how many times an employee visits the toilet." Such use of office automation violates the collective-bargaining contract, according to the guild, since it changes basic conditions of employment without union consent. The guild said the system is also "an infringement of individual liberties" that "ill becomes a great newspaper that is also a champion of freedom of the press and individual liberties."

Though oral assurances were given by a supervisor that the log system would not be used for "disciplinary purposes" or to create unfair work quotas, union efforts to get management to give written assurance on how the system would be used were unsuccessful. As of July 1983, buttons began to be worn by Times employees saying, "1984 - 6th Floor."

In the nonunion firms we visited, employees are subject to the same concerns and uncertainties over "machine monitoring." Yet only a handful of these companies have developed a coherent policy on evaluating CRT work.

Given these new issues of privacy and confidentiality arising in OA settings, what ought to be done by organizations, and who ought to be doing it?

First, organizations moving heavily into office automation need to draw up an audit of how OA is being used in ways that handle identified client, customer and employee data. Categories need to be developed to identify which personal information flowing through OA systems is sensitive and the potential legal and regulatory exposures involved. Types of individual and group end users also need to be identified as creators and distributors of confidential information.

Second, a set of privacy and confidentiality standards or principles needs to be enunciated, based on an organization's existing rules for its manual and DP data or developed from the codes that many other organizations have adopted in recent years. This code would then be applied to the major privacy issues emerging in OA activities to develop appropriate policy guidelines.

The issue of monitoring CRT operators provides a good example. Defining acceptable standards of performance is as old as organized work itself, and setting norms individual employees should meet has been a part of the office since the days of the wax table. What is new — and requires new policy from managements — is how to use the monitoring capacities of office automation in ways that are perceived as fair to both employer and employee and

***In the nonunion firms we visited, employees are subject to the same concerns and uncertainties over "machine monitoring." Yet only a handful of these companies have developed a coherent policy on evaluating CRT work.***

that also meet notions of "humane" rather than "machine" measurement.

In terms of fair information practices, this policy means:

- Information should not be collected without the individual's knowledge.

- How the information is to be used should be disclosed.

- Unnecessary individual performance data should not be kept for unfairly long periods of time.

- Data should be used to evaluate the "whole context" of the employee, the task, the tool and the job setting, not just the log-in, keystroke or transaction records.

For example, in many of the organizations we studied, introducing OA for clerical and customer-service operations resulted in considerable system downtime or slow response time, changes in the data available to CRT operators in performing their

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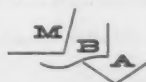
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jobs and new patterns of employee-customer interaction. A few of the companies we visited appreciated this. Management made it clear to the CRT operators that no pure "quantity"-oriented evaluations would be used as the basis for judging employ-

ees. Instead, group performances would be studied and discussed by supervisors on a work-unit basis, and individual performance reviews would be private sessions between supervisor and employee. All the problems created by installing

new OA systems would be taken into account when arriving at "fair work" norms.

In organizations where unions are present, such discussions include participation by union representatives. At the U.S. Internal Revenue Service, for exam-

ple, a joint management-union CRT evaluation project is under way with the National Treasury Employees' Union to define productivity norms and employee participation in productivity gains for a major new terminal system being implement-

ed by the IRS.

Once new policies are established, organizations must communicate these clearly and strongly to end users and conduct appropriate training programs in privacy and confidentiality procedures. A routine of sampling or randomly auditing the contents of micros used at the work place needs to be instituted, as much for its value in creating policy consciousness on the part of end users as for what such audits will turn up in the end user's machine.

Whether auditing a manager's personal computer represents a violation of his privacy is an interesting issue. Following traditional legal doctrines, where examination of lockers, desks and on-premise briefcases of employees has been carried out to protect genuine security and confidentiality policies, advance notice of the audit policy is given to the employee, and the audits are done in a reasonable manner. The courts have sustained such activity as reasonable conduct by the employer.

As to *who* should be directing the application of privacy and confidentiality policies to new office automation systems, the obvious — and proper — candidate is the DP function. Personnel, medical, legal and public affairs departments may be aware that new issues are arising and will often have important insights to contribute to developing new policies and procedures. But it is the DP people in most organizations who have two decades of experience in applying privacy protection to automated information systems. It is their baby.

The time for action has come. Responsible business and government organizations should be addressing this issue now, especially if voluntary standards rather than regulatory intervention are to be the primary response of the next few years.

### About the Author

Alan Westin is professor of public law and government at Columbia University. Author of four books and numerous articles on privacy in information systems, he is currently directing a national study of "The Workplace Impact of Using VDTs for Office Activities."

Westin is also president of Changing Workplaces, an information and consulting service in Englewood, N.J., that deals with the people aspects of technological change in organizations.



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## IN DEPTH

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# Kanji Keyboard Chaos

By Raymond R. Panko

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*Imagine input and output in a language with 50,000 characters. What Japanese engineers are learning the hard way may help them leapfrog American technology in office automation.*

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The rich complexity of written Japanese has long delayed Japan's entry into office automation. No simple keyboard can hold the thousands of characters found in the country's three forms of writing.

Today, however, this roadblock is being broken, and the techniques the Japanese have created to handle the "keyboard problem" are making *pasos* (personal computers) and *waapuros* (word processors) commonplace. These techniques, furthermore, could leapfrog the Japanese ahead of American and European word processing manufacturers, because Japanese solutions to the keyboard problem involve sophisticated grammatical analysis.

The spoken Japanese and Chinese languages have little in common. Spoken Japanese is polysyllabic and simple to pronounce. Spoken Chinese tends to be monosyllabic and richly tonal. Despite vast differences between the two

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The moral is that somewhere between pumpkin and watermelon was a solution just right for any game situation—the modern football. Likewise, between too much and too little computer is a system that offers the right solution for most business applications—Zilog's System 8000 supermicros. They're much more powerful and versatile than personal computers, yet priced far less than mainframes and minis. It's been a winning game plan for us, because it helps our customers win at theirs.

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## IN DEPTH

spoken languages, Japan adopted China's written language as its own. Since written Chinese is ideographic with each ideograph representing a whole word, this adoption was fairly easy; but as a result, Japan now has a written language unrelated to its spoken one.

In Japanese, Chinese characters are called *kanji*. There are about 2,000 *kanji* in everyday use, but about 10,000 are used with some frequency, and a complete dictionary will contain about 50,000 *kanji*. So the two countries now have radically differ-

ent spoken languages but similar written languages. (Time, of course, has caused the two written languages to drift apart.)

Over time, the Japanese moved away from pure *kanji*, developing two simpler phonetic forms of writing called *katakana* and *hiragana*. Each form evolved from sets of *kanji* with useful phonetic sounds. In each case, a simplified way of writing the selected *kanji* was developed. *Katakana* basically selected a few keystrokes from the original *kanji* character. Its *kana* (characters) tend to consist of a

few straight lines. *Hiragana*, in turn, developed as simplified scrawls to represent each of the selected *kanji*. Its *kana* tend to be curvy.

*Hiragana* can express any Japanese word phonetically. So can *katakana*. Then why have two complete sets of phonetic writing? Because *hiragana* is used to write native Japanese words, such as the morning greeting *ohayo gozaimasu* (literally, "it is early"), while *katakana* is used to write foreign words such as *panko* (bread flour).

It usually strikes Westerners as

odd to use two separate sets of writing for native and foreign words, but we do something like this in English, italicizing foreign words and phrases, such as *ohayo gozaimasu*. And just as foreign words such as "etc." gradually lose their foreignness in English and so lose their italics, long-standing foreign words in Japanese tend to pass from *katakana* to *hiragana*.

Then where does the huge *kanji* character set come into all this? It turns out that words expressed in *hiragana* and *katakana* may be ambiguous. For example, "bridge," "chopstick" and "edge" would be written and pronounced the same way in *hiragana*, as *hashi*. To give another example, "cloud" and "spider" are *kumo*. So the same sentence in *hiragana* might be read as, "See the cloud behind the bridge" or "See the spider behind the chopstick."

Whenever such ambiguity exists, the proper *kanji* — which is always unique — is used.

Written Japanese, then, is a mixture of three types of writing: *hiragana*, *katakana* and *kanji*. In traditional forms of printing, such as newspapers and books, the language is usually written in vertical columns, from top to bottom. The columns march across the page from right to left, and books and magazines begin at what Westerners would think of as the back cover. Most often, however, Japanese is written horizontally, especially in modern types of printing, such as technical papers, and also in many newspaper headlines. Then the characters are written left to right.

### Building Keyboards

Because the Japanese are very interested in office automation, which they simply write "OA" in the Western script and pronounce "oh-aye," they have been struggling for years to build a reasonably simple keyboard, and to a large extent they have now succeeded.

The simplest approach to facing the keyboard problem is found in the cheapest personal computers. This solution is the use of *katakana* only, letting the user resolve ambiguities from context and ignoring the traditional foreign/native distinction. *Katakana* is used instead of *hiragana* because *katakana* consists mostly of straight lines, and even fairly inexpensive printers and displays can show it well.

But for real business uses, full written text in all three forms of script is required. To handle this need, a more expensive approach is taken in which both *katakana* and *hiragana* characters are put on the keyboard. A shift key allows the typist to switch between the two sets of characters. *Katakana* and *hiragana* characters are referred to, collectively, as *kana*. There are about 50 *kana* each in *hiragana* and *katakana*, so there is no difficulty in representing all *kana* on a normal-size keyboard.

The tricky part is handling the *kanji*, of course. The obvious way to



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handle them is to analyze each word as it is typed in kana. If the word is ambiguous, then the most probable kanji is inserted in the sentence, but the typist can select alternative kanji if the one inserted is incorrect. This method was the first way vendors used to handle kanji, and it is still the core approach taken by vendors today.

But if the user has to choose alternative kanji often, the typing process will be extremely slow. So, many of the products on the market in Japan now go a step beyond word frequency in selecting the "first-guess" kanji to insert in the sentence, and this added step could put Japan at the forefront of language processing by computer in the future.

This added step is grammatical analysis. Japanese products analyze the grammar of the typed sentence on the fly, selecting the most probable kanji on the basis of its grammatical position in the sentence. This feature greatly improves the chance of getting the first guess right so that the typist can merely go on.

Although spelling correction is popular on U.S. word processing systems, the additional wrinkles of adding on-the-fly word checking and grammatical checking represent a major step forward in user assistance. In the U.S., the addition of proof-reading functions such as these is viewed as a jazzy feature, and development has been relatively unhurried. But in Japan, on-the-fly checking and grammatical analysis are make-or-break problems. If the Japanese develop expertise in these areas substantially before U.S. vendors, it would not be hard to imagine a strong flow of Japanese products into the West.

#### The Spoken Word

The Japanese are also pushing hard in voice recognition. Here, the key is the relative simplicity of the Japanese spoken language. Japanese vowels are extremely regular and are pronounced in the Spanish manner. In addition, Japanese lacks the tonal complexity of Chinese.

Given the small set of Japanese phonemes — about 50, depending on how one treats near duplications — it is possible to recognize individual phonemes easily. And the Japanese have long been able to do voice-to-kana translation for noncontinuous speech in which each phoneme is pronounced separately.

Because Japanese managers do not have the long history of college typing shared by Western managers, voice recognition is an obvious goal of vendors. The early success of voice recognition for noncontinuous speech is spurring intense work on the problem of recognizing continuous speech, in which sounds flow together.

It is too early to say how rapidly the Japanese voice typewriter will arrive, but when you consider that sophisticated Japanese word processors today sell for only \$4,000 to \$6,000 in Japan, complete with printer, it is

fairly safe to project that the prices of these voice-driven machines will be competitive.

#### What About Chinese?

Word processors for Chinese are also being developed rapidly. Since the Chinese use pure ideographs — the Japanese kanji — and have no simplified form of writing like the Japanese kana, most efforts to produce Chinese word processors have involved giving each ideograph a numerical code.

Of course, no one wants to memo-

rize 10,000 to 50,000 codes, so simplifications have been developed, notably the "three-corner coding method" developed in Taiwan. In this approach, 99 character "roots" have been identified. An ideograph is represented as a composite of one to three roots. These roots must be memorized, along with their two-digit codes.

To type an ideograph, the operator looks first at its upper left-hand corner. He then types the code for the root nearest that corner. That root is mentally removed from the

character, and the operator next looks at the upper right-hand corner, again typing a code for the root in the remaining part of the ideograph that comes closest to that corner. Third, that second root is also removed, and if there is any part of the ideograph left, the operator looks at the lower left-hand corner and keys in the code for the remaining root. Three roots are enough for all ideographs.

In other words, each character is viewed as being an overlay of one, two or three basic roots. The overlays

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## IN DEPTH

are peeled off one by one, and their codes are typed as this is done. The process sounds very cumbersome, but is not overly difficult for trained operators. I once observed an operator using the technique, and her speed was fairly good.

For managers and professionals, of course, a simpler method must be used. One approach is to put a limited number of phonetic symbols on the keyboard and to type the ideograph's sound. In Mandarin, spoken in Taiwan, for instance, all children are taught a phonetic alphabet with

37 sounds. Each sound is represented by an ideograph whose spoken form has that sound.

With this phonetic approach, using a Chinese word processor or personal computer should be much like using a Japanese word processor, although every word must be converted into an ideograph instead of just a phonetically ambiguous one.

In practice, the Chinese phonetic system is a good deal more difficult to handle than the Japanese system. First, there are different dialects of Chinese, and even within a "stan-

dard" dialect there are some regional differences. So while all Chinese will use the same written language, phonetic interpretation must be tuned to dialect.

Furthermore, just as spelling in English did not become standardized until fairly late in the history of our language, two Chinese who speak exactly the same dialect may type the same word differently in phonetic typing.

Despite these troubles, managerially and professionally oriented personal computers should appear for

Chinese in the very near future.

In some areas of corporate information technology, Japan is on a par with the U.S. According to figures compiled by the Japan Institute for Office Automation (JIOA), for example, Japan had one general-purpose computer for every 853 employees in 1979, while the U.S. had one for every 843.

For general-purpose computers, the Japanese have "solved" the keyboard problem by programming in Fortran, Cobol and other Western programming languages which require only a bit of English.

Not surprisingly, the Japanese are ahead of the U.S. in some visually oriented technologies. In 1979, for instance, the U.S. had one facsimile machine for every 274 employees, while Japan had one for every 139. Of course, the U.S. also uses many text forms of electronic mail, which are rare in Japan.

But for word processors and personal computers, Japan still has a long way to go to catch up. In 1979, the Japan Institute for Office Automation could count only one word processor for every 23,740 employees in Japan, compared with one for 104.9 in the U.S. While personal computers were not counted, there probably were few in Japan.

A recent survey by the JIOA indicates that the process of catching up is at least beginning. Forty-eight percent of companies surveyed by the institute reported recently purchasing some personal computers, and 40% said that they had purchased Japanese word processors. It is too early to say how rapidly Japanese use of personal computers and word processors will grow, but the trends are strong.

The only weakness on the horizon is that the Japanese are jumping into word processing with stand-alone units, while in the U.S., clustered systems are becoming the norm. Clustered word processing systems are generally a firm's first step into the "systems era" of office automation and usually signal that the firm is at least beginning to understand the need for systems that allow information to flow freely throughout the office.

As the density of word processors grows in Japan, a gradual shift from stand-alone units to clustered systems will almost certainly occur, but Japan may be missing a chance to jump directly into the systems era.

### About the Author

Raymond R. Panko is an associate professor of decision sciences at the University of Hawaii. He previously worked for SRI International.

His areas of specialty include office automation planning and electronic mail. Several of his articles on these subjects were translated for the Japanese publication, *Jimu To Keiei*. Wang Laboratories, Inc. sponsored Panko's travel this summer to Taiwan, Singapore, Hong Kong and Japan, where he gave seminars on office automation and corporate information management.



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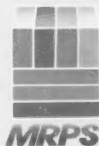


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### Three Different Levels. Three Different Needs.

Typically, today's leading organizations have three levels of implementation: Strategic, Tactical and Local.



The highest level of a corporation's informational hierarchy is the "Strategic" level. The Strategic level is the headquarters of the MIS Department and traditionally the home of the

IBM corporate mainframe. Characteristics of the Strategic level typically include a powerful, high performance software system, a relatively large staff and end-user interaction in either the Development Center, the Information Center or both. It is here that long-term planning is conducted and operational information that supports the overall corporation is processed.



The next level is the "Tactical" level. This level of system implementation addresses the divisional or departmental information requirements with operational systems. Typically, the Tactical level is an extremely interactive environment. It is trans-

action oriented. And it is almost exclusively an on-line, real-time situation. The powerful DEC VAX minicomputer has proven extremely effective in this environment and holds a prominent position alongside mid-range IBM hardware in many organizations.

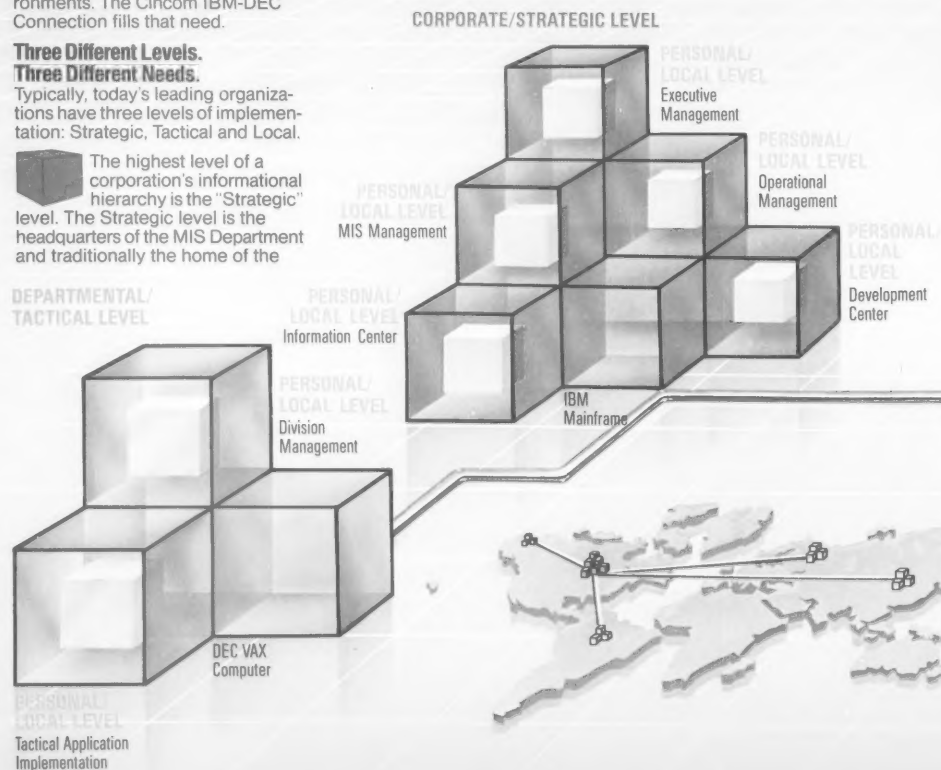


The third level in the informational hierarchy is the personal or "Local" level. These are the areas throughout the organization that provide end-users with the capability to meet their own personal or departmental information needs. Local systems must, of course, be easy to learn and use. Ideally, they will be linked to either the Strategic data base, the Tactical

data base or wide decision of accessing the IBM and

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# THE ARCHITECTURE:

base or both. And they will provide decision support tools capable of processing information from both IBM and DEC environments.

## Benefits Of The Cincom IBM-DEC Connection.

In the perspective of the MIS Director, all three levels of the informational hierarchy should be as compatible as possible. However, before the Cincom IBM-DEC Connection, the vast difference in systems architecture made compatibility virtually impossible. But with the commonality of TIS and ULTRA, software applications are virtually independent of their hardware. The dawn of the Cincom IBM-DEC Connection heralds the day many corporate MIS Directors have long been waiting for.

The architectural approach of the Cincom IBM-DEC Connection ensures high levels of data integrity, security and application compatibility throughout the organization. Users operating in their individual environments now have at their disposal software tools that are consistent with other departments and with corporate information procedures. And the company as a whole can make positive progress toward a true distributed network environment.

## POWERFUL. RELATIONAL. COMPATIBLE.

The software architecture of the Cincom IBM-DEC Connection incorporates three powerfully interactive information systems: TIS, ULTRA and for manufacturing organizations MRPS. Together, they provide the highest degree of compatibility and consistency available today across IBM and DEC VAX equipment.

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The building blocks of the Cincom IBM-DEC Connection architecture are TIS, our interactive, relational software system for IBM mainframes, and ULTRA, our interactive, relational, high performance data base system specifically designed for the DEC VAX.

With TIS at the Strategic level and ULTRA at the Tactical level, users have at their disposal a powerful, relational set of software tools which will facilitate implementation of even the most aggressive corporate information strategies.

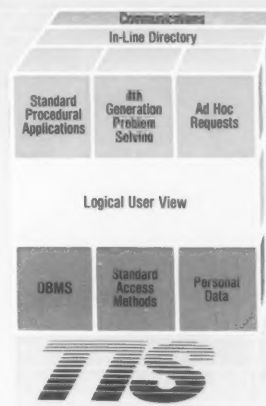
The relational power of these systems comes from the nucleus of both TIS and ULTRA. With both systems, the **In-Line Directory** is the one component that interactively integrates all other components. The **Logical User View** component provides a relational view of data for both application programmers and end-users. This relational Logical User View also insulates users from data structures, the physical storage mediums and even the DBMS itself. **LUV** both protects the application investment and increases end-user efficiency. And, the

advanced **DBMS** component provides support for normalized subject data structures and relational data association technology to provide power and efficiency for both application processing and end-user interaction.

Because of their common architecture, applications are built the same way with both TIS and ULTRA. This means that applications in all levels of the corporation are implemented using one common and compatible approach. Once completed, applications can even be transported from one hardware to another with little or no change.

### 4th Generation Problem Solving Tools.

Two other components common to both TIS and ULTRA are **Intelligent Query** and **Reporter**. Together, they enable end-users to satisfy their own non-procedural, ad hoc

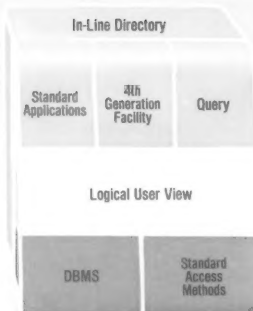
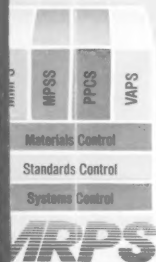


## DEPARTMENTAL/ TACTICAL LEVEL





# THE CONNECTION AT WORK:



## Manufacturing Control Application Software.

The third system in the architecture of the Cincom IBM-DEC Connection is MRPS—our comprehensive manufacturing control software system that is compatible with both IBM and DEC VAX environments. Tightly integrated with TIS and ULTRA, MRPS provides a complete closed-loop manufacturing system. MRPS is a

modular system and is capable of being fully integrated with a Tactical level DBMS such as ULTRA or a Strategic level system such as TIS. From production planning, to inventory control, to vendor analysis, MRPS provides manufacturing operations the information tools necessary to reduce costs dramatically.

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With TIS operating at the Strategic level, and ULTRA operating at the Tactical level, the Cincom IBM-DEC Connection at last becomes a

reality. Now, one common software architecture and one common approach to application development, implementation and data base management assures consistency and eliminates conversion across these two hardware environments. Rather than being locked into your software you now have total software flexibility. And, as your needs evolve, so will the technologies of Cincom Systems.

## INSULATION FROM YOUR HARDWARE. INSULATION FROM YOUR DBMS.

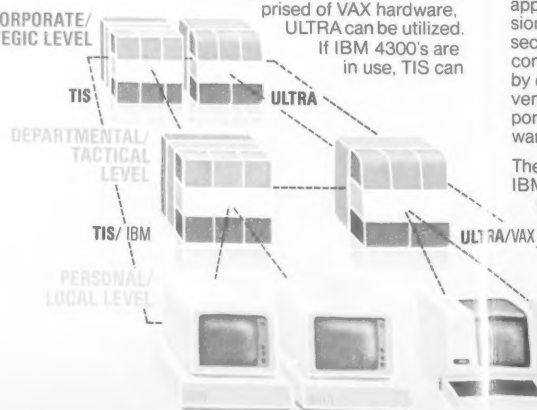
By implementing the Cincom IBM-DEC Connection virtually limitless information management opportunities now become possible. Because applications are insulated from both hardware and DBMS, restrictions from exploring new software strategies are drastically reduced.

## Tailoring The Connection.

All corporations will, of course, have their own specific adaptations of the Cincom IBM-DEC Connection. However, here are two simple scenarios displaying how this common software architecture can be utilized in a corporation to provide a consistent approach to application development and implementation throughout the Strategic, Tactical and Local levels.

**Scenario A** depicts the consistency of the Cincom IBM-DEC Connection. Using TIS on the corporate mainframe, and ULTRA on the corporate level VAX computers, programs can be developed and utilized at either the Strategic or Tactical level. Or, they can be developed at the Strategic level and passed across to the Tactical level of the organization to run on either a VAX or an IBM processor.

If the Tactical environment is comprised of VAX hardware, ULTRA can be utilized. If IBM 4300's are in use, TIS can



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requests in minutes instead of hours with virtually no need to be conversant with typical programming or data base logic.

Yet another 4th Generation relational component is **MANTIS**.<sup>™</sup> Currently part of TIS and soon to be integrated with ULTRA, MANTIS is our application development language that combines the flexibility and ease-of-use of interactive, interpretive systems with the power and range of procedural languages. MANTIS fully supports the relational data view so desirable today. It provides complete beginning-to-end, on-line application development across virtually all types of on-line environments. And, MANTIS is so easy to learn, end-users at the Local level are able to write their own programs, often with no assistance from trained programmers.

# SECTION

## THE SOURCE:

be implemented. From the Tactical level, applications can be distributed to end-users at Local levels throughout the corporation providing a consistent approach to software implementation.

**Scenario B** shows how the Cincom IBM-DEC Connection might be utilized to consolidate corporate information in a manufacturing organization. At the Tactical level, manufacturing applications can be implemented with MRPS to support needs of that environment as well as the Strategic needs of the corporation. Users of Cincom's TOTAL® at either the Strategic or Tactical levels benefit from both compatibility and an easy migration path forward to next generation technology.

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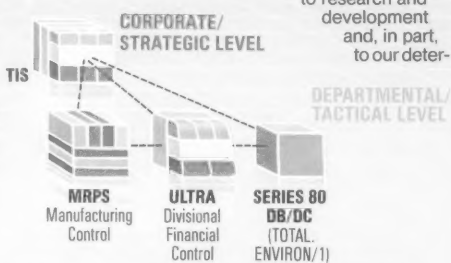
- ☐ Compatibility in application development and implementation.
- ☐ Insulation from hardware and data base technology.
- ☐ A consistent approach for end-users and professional programmers.
- ☐ Greater data security and control.
- ☐ An overall continuity that can only be achieved by doing business with a software vendor which is committed to supporting both of these major hardware firms.

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# What Price Relational?

By William H. Inmon

It is currently the vogue to proclaim that relational systems are the solution to the many headaches of data processing, in much the same way the data base concept was touted a decade ago. But are relational systems the panacea that will address everything from productivity to user satisfaction?

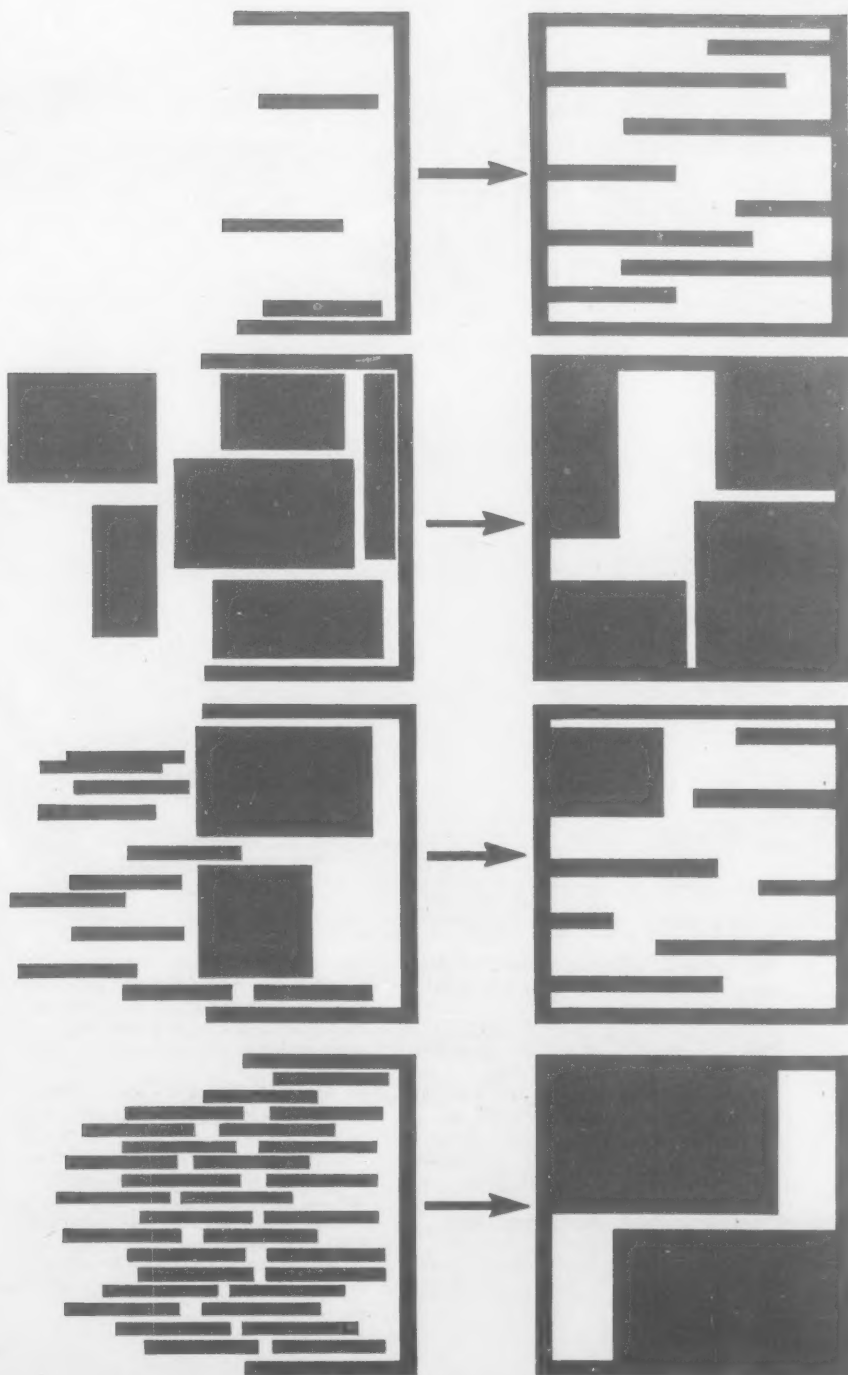
It is true that relational systems unquestionably are much more flexible than their hierarchical or network brothers. But is there a price to pay for that flexibility?

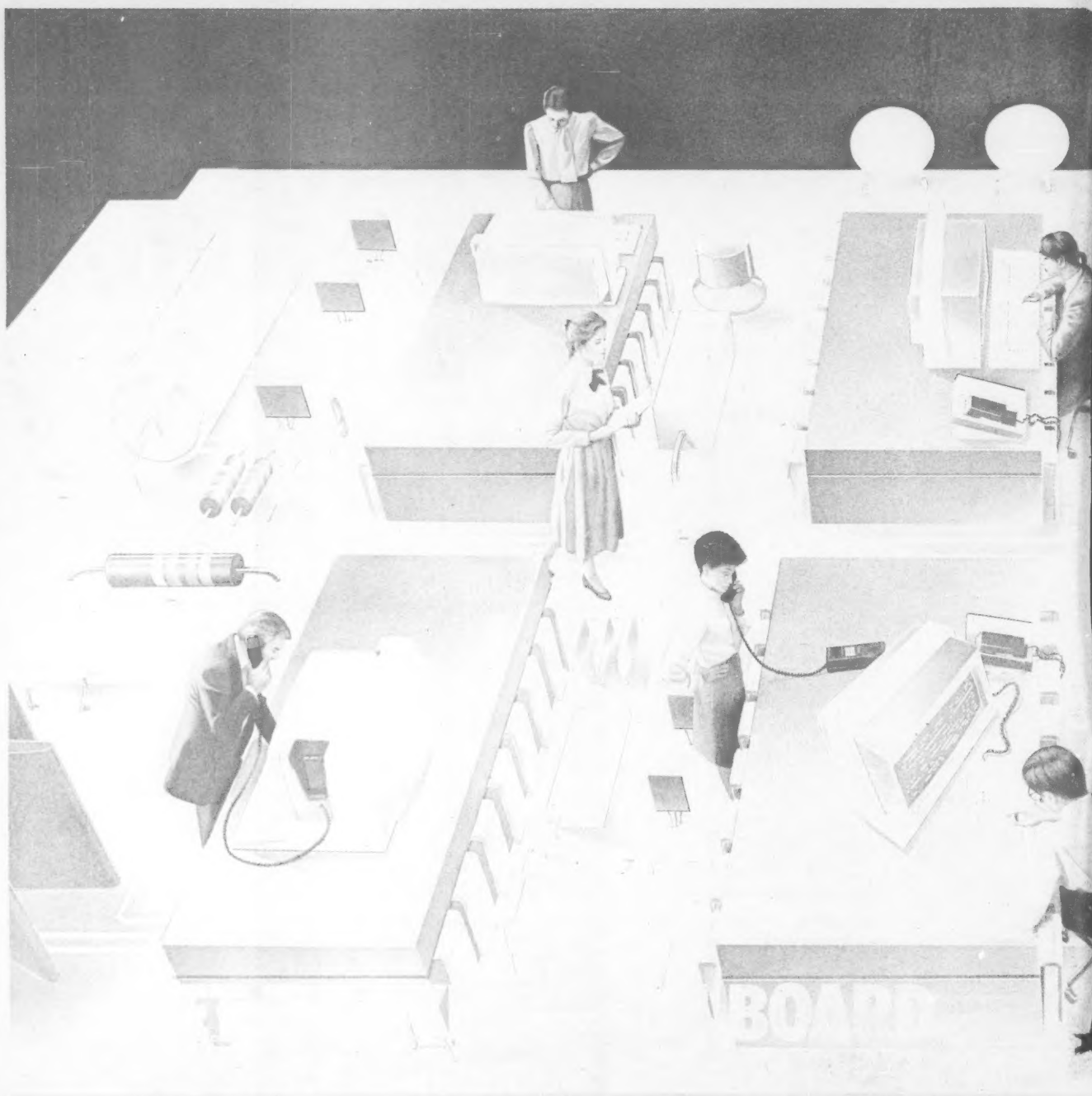
Early relational pioneers such as Ted Codd and Chris Data are attributed with statements to the effect that "relational systems are not necessarily inherently poor performers" when it comes to response time. But in practice, there is every evidence that such is not the case. In both the minicomputer and main-frame environment, relational systems need huge amounts of resources to sustain any reasonable amount of performance.

Witness recent announcements about IBM's forthcoming DB2. At the product's introduction in New York last June, Sam Kahn, advanced data base products manager at IBM's Santa Teresa Labs, said projections showed DB2 using "significantly more systems resources, both machine cycles and memory," than IMS.

In analyzing relational systems in existing environments, the reasons why relational systems perform poorly can be isolated. From those reasons, it is safe to say that poor performance is, in fact, inherent to the relational environment, given today's hardware, software and economic climate.

The resistance to the notion that relational systems do not perform poorly goes back to the relational movement itself, which has an academic founda-





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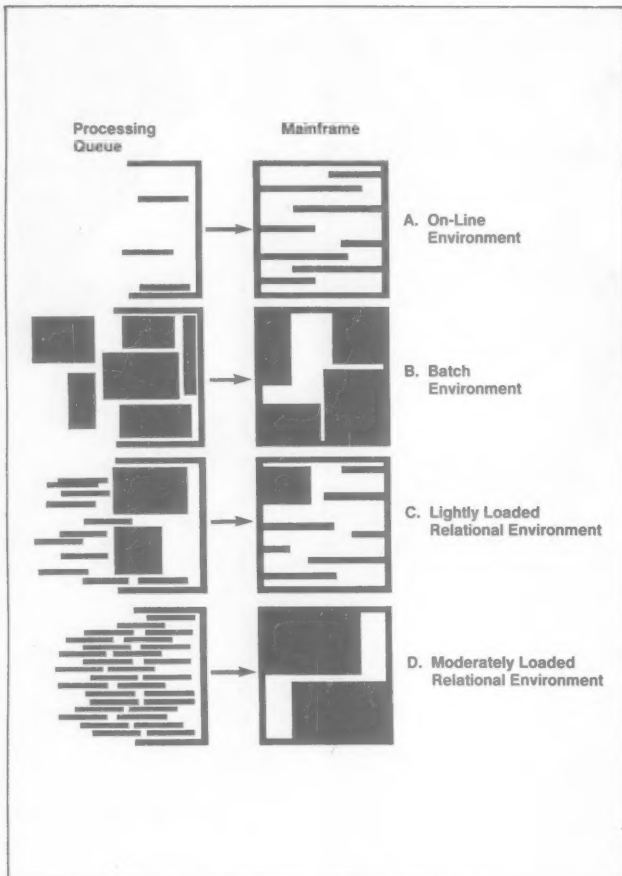


Figure 1. Processing Environments

tion. The relational movement is founded in a batch mentality. Relational proponents are always "keeping things under the covers." Indeed, the leading book on relational systems, Chris Date's *An Introduction to Database Systems* (Addison-Wesley, Reading, Mass.) makes no mention of

I/O whatsoever and only mentions performance casually in three referenced places.

At the root of relational systems' inability to perform is I/O. In an on-line environment, I/O is the single most important limiting factor because I/O requires the execution of

*The freedom of dynamic relationship is bought at the expense of having to search for data in diverse places and having to construct relationships dynamically. This expense shows up directly in terms of I/O.*

code to shift from electronic (or nanosecond) speeds to mechanical (or millisecond) speeds. This shift

dictates that on-line performance relates more to I/O than any other factor.

There are two levels of I/O usage in the relational environment that cause difficulties — at the data access level and at the call level. Of the two, the difficulties at the call level are much more harmful, although the theorists almost exclusively center in on the I/O done at the data access level. The two types of levels will be discussed in depth.

The I/O difficulties at the data access level occur because relational data bases, in their normalized state, are very disjoint. A typical relational environment consists of many separate tables (or relations), none of which are physically connected. Because of this lack of connectivity and the disjoint data, the resulting system is very flexible. Relationships are formed dynamically.

But the freedom of dynamic relationship is bought at the expense of having to search for data in diverse places and having to construct relationships dynamically. This expense shows up directly in terms of I/O.

Hierarchical data bases are not nearly as flexible, but data is generally grouped together and relationships have been predetermined, thus reducing the amount of I/O that is

required.

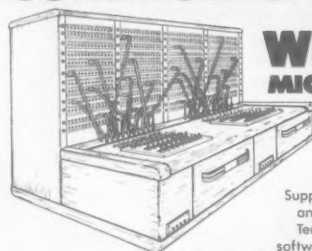
To understand better the nature of I/O at the call level and how it relates to performance, divide on-line activity into two classes — short-running activities and long-running activities. A short-running activity is one that uses very little I/O, such as, "Tell me the account balance of Delilah Perkinson."

A long-running activity is one that uses much I/O, such as a data base scan. An example of a long-running activity might be to select the highest account balance from a payroll data base where accounts of executives are considered. Now consider how machines react (at a very basic level) to activity flowing through them.

#### Nature of Machines

First consider what an on-line system looks like in terms of a queue, a processor and activity running through the processor, as shown by Figure 1A. The activity running through the processor is represented by small rectangles. Such an environment is like the Airline Control Program (ACP) environment. The airlines clerk has much function at his fingertips, but accomplishes the function a small piece at a time. To book a transcontinental trip, the first leg from New York to Chicago is booked, then another on-line activity is entered to book from Chicago to

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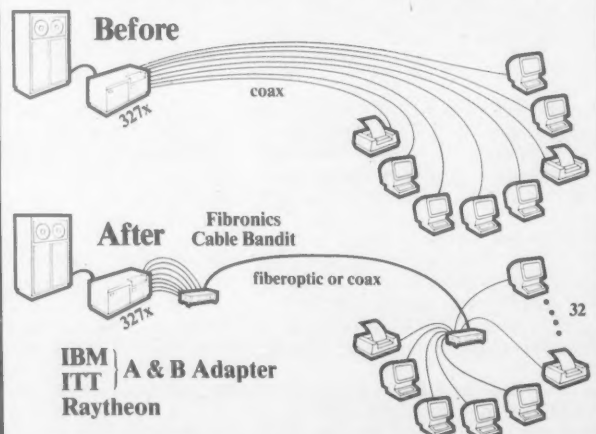
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Dallas. A third activity is entered to go from Dallas to Denver, and a final activity is entered for the leg from Denver to San Francisco.

In all, four small activities were entered, instead of a single, larger activity. And each of the small activities is achieved with very quick response time. Now consider what a batch environment looks like.

Figure 1B shows that large activities — data base scans, updates and so forth — are being run. A large rectangle represents a long-running job. In the batch environment, large programs are run, and turnaround is measured in terms of hours, if there is any amount of traffic on the system at all.

What happens when long- and short-running transactions are mixed, as is normal in the relational environment? Figure 1C shows this case. As long as there are few demands for system resources (that is, a very light transaction load), the two types of activities mix fairly well. But when there is anything close to approaching a heavy load, the system performs as shown in Figure 1D.

Here the long-running activities are "hogging" the machine. The short-running activities are queued behind them. At this point, response time is terrible. The system is run-

ning at the speed of the slowest activity. Fast-running activities cannot get at resources to execute.

#### A Typical Relational Day

To put the different characteristics of a machine into context, consider a typical day on a mainframe in a relational environment, as shown by Figure 2. At 8 a.m., users are able to get very good response time. When a user asks, "What is Delilah Perkinson's account balance?" the reply comes back in seconds. But at 10 a.m., the system is heavily used, operating at the speed of the slowest transaction. Now a user asks, "What is Bill Inmon's account balance?" and has to wait 45 minutes while the system is executing user requests that use many resources.

A more typical environment is shown at 1:30 p.m., where the response time fluctuates wildly, depending on what is in the system. Finally, at 7 p.m. the machine turns into an almost pure batch machine as data bases are loaded and so forth.

#### In Micro Environment

It has been suggested that going to the micro environment will solve the problems of poor response time that are typically associated with the relational environment. It is true that

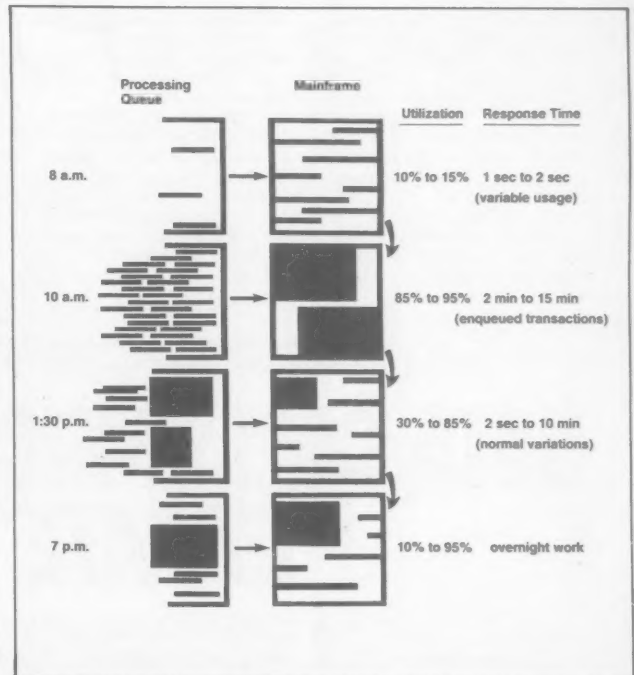
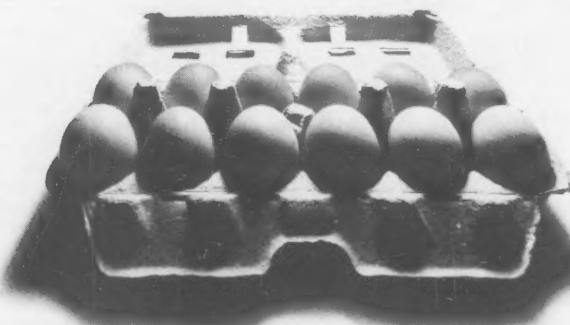


Figure 2. Mainframe Utilization in the Relational Environment

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once into the micro environment, there is no problem with impacting (or being impacted by) other programs, as is the case in the mini or mainframe environment. But there are some severe limitations to the micro environment. Some of them are:

- The amount of data being handled. Even in the micro environment, when there is a large amount of data to be manipulated (and "large" in the micro environment is far different from "large" in other environments), I/O takes up considerable time.

- Difficulty in getting the data to the micro in the first place.

- Difficulty in putting the data back in the mainstream when processing is done.

But a more basic problem is the fact that going to the micro environment means the data is taken off-line, which to a large degree defeats the purpose of the on-line environment. In other words, if data can be taken off-line (and thus removed from the on-line system), then the issue of performance is moot.

It is argued that hierarchical lan-

guages such as IMS can scan entire data bases as well as relational systems such as SQL. It is true that IMS can do data base scans, but in the on-line environment (that is, an on-line region), good design dictates that it not be done. IMS does have batch capabilities (BMP), but they are either not run at all in the daytime or else they are carefully checkpointed so that they use resources like on-line transactions. So data base scans are not a problem in a mature, on-line IMS environment.

But in a relational environment

(typified by SQL), it is normal and natural to scan entire data bases. Relational systems, by fiat of their ease of use, do not place restrictions on the user. The user is as likely to scan data bases averaging account balances as the user is to seek information about a single account.

## Control

But the real clinch comes in the control that is possible. In IMS, if there is an offensive transaction that does scan a data base, the transaction can either be debugged or removed. When it is removed, obviously it is no problem. When it is debugged, it is no longer capable of chewing up many resources. It is recompiled and put into object form. After that point, the user is not capable of abusing the system with the transaction.

But in the relational environment, no such controls are imposed. The nonprocedural nature of the relational environment is such that systems requests are handled interactively, not in a precompiled mode. The user is able to operate free-form at a terminal.

The very essence of the relational environment is user freedom. Imposing restrictions on the user (even if they make sense) goes against the relational philosophy.

Thus it is that with existing software and hardware, relational systems perform poorly. There is a price to the flexibility of relational systems, and unfortunately the vendors of relational software often choose to ignore that price.

## Operating Systems Solutions

It is tempting to say that solutions can be found at the operating system level. One solution that has been tendered is the classification and segregation of long-running relational requests from short-running requests.

There are two problems with this approach. The first is that given the syntax of a language like SQL, it is very difficult if not impossible to separate requests. The problem is that until the request goes into execution, it cannot be determined whether it will be short-running or long-running. Ideally, requests could be separated at the syntax level.

The second problem with separation of requests is that it means that long-running requests will become second-class citizens. Instead of a long-running request taking 30 minutes to an hour to run, because it is segregated with other long-running transactions, it has a much slower time getting through the system — say 10 to 20 hours. The relational environment, in its attempt at user friendliness, does not make a distinction between long-running and short-running jobs.

A second operating system solution is that of removing a long-running activity from the system so that short-running activities can execute, then replacing the long-running activity into the system when the system is idle. This solution, too, has the

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effect of making long-running activities take even more time. But there is an even greater loss — the integrity of the program being executed.

For example, suppose a long-running activity is to sum up all the payroll for a

given pay period. It goes into execution, going from one record to the next, adding up pay. Now suppose that halfway into the execution of the program, the pay calculation is interrupted. A shorter program comes in and does such things as add new employ-

ees, delete employees or perhaps change pay balances.

Now the pay calculation activity resumes where it left off. Is the value calculated going to be valid? Perhaps, but perhaps not. What if a new employee was added? What if an employee has

been deleted? The integrity of the long-running activity has been destroyed.

Therefore, solutions at an operating system level are stymied at a fundamental level. On-line practitioners that have successfully operated the on-line environ-

ment have long known about the standard work unit, something that is violated at a most basic level by relational systems.

## Hardware Solutions

In Codd's original specification of the relational environment, it was specified that content-addressable memory be used, rather than conventionally addressable memory.

There are difficulties with this approach, even though it exists commercially today (but not as a major market force).

The first problem is the economics of the situation. Content-addressable memory is expensive because of (among other things) the required customization at the hardware level. But there is even another problem. Even if such memory was cheap, all that it solves is the simultaneous searching of data — it does not solve the processing of the data.

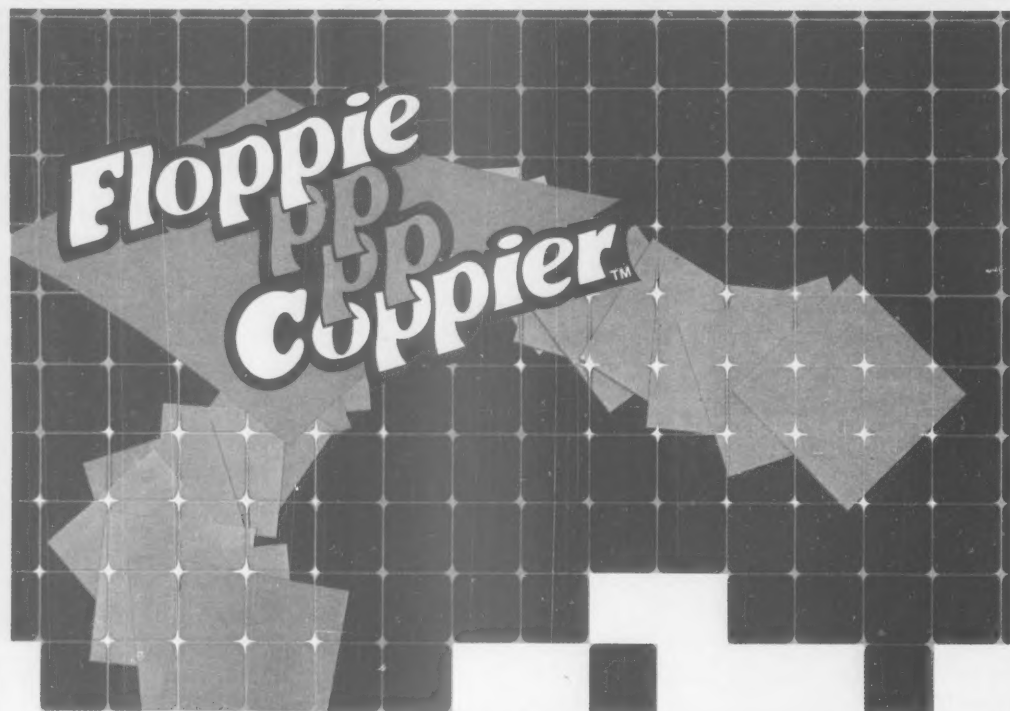
Even if much memory can be searched in nanoseconds, it still is processed single file. To make content-addressable memory effective requires parallel processors as well. At this point, the issues of data integrity become very clouded, not to say the least of the economic issues. If content-addressable memory is not commercially feasible, then coupled with parallel processors, it is certainly economically questionable.

So it appears that if the solutions to I/O lie in hardware, they are a long way (if ever) in coming. Until then, I/O will remain the dominant factor to on-line performance, and relational systems will remain inherently poor performers whenever there is anything more than a very light transaction work load or where there is much data.

Much has been said about user satisfaction, nearly all of it at the syntax level (which is surely important). But syntax represents only one aspect. Whoever says that performance is not an essential ingredient to user satisfaction reflects a batch mentality. Whoever ignores performance issues in the face of the reality of hardware, software and economics faces ridicule.

## About the Author

William Inmon is director of Coopers & Lybrand in Denver. He has 16 years' experience in the large mainframe environment as a consultant, data administrator, programmer, manager and system architect.



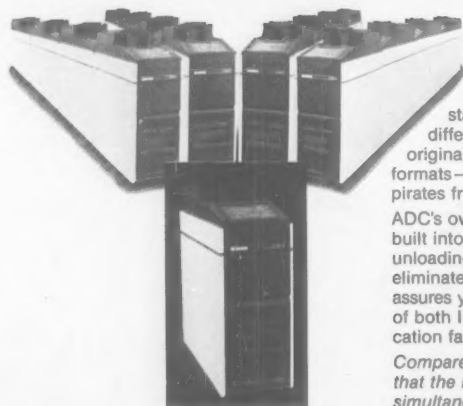
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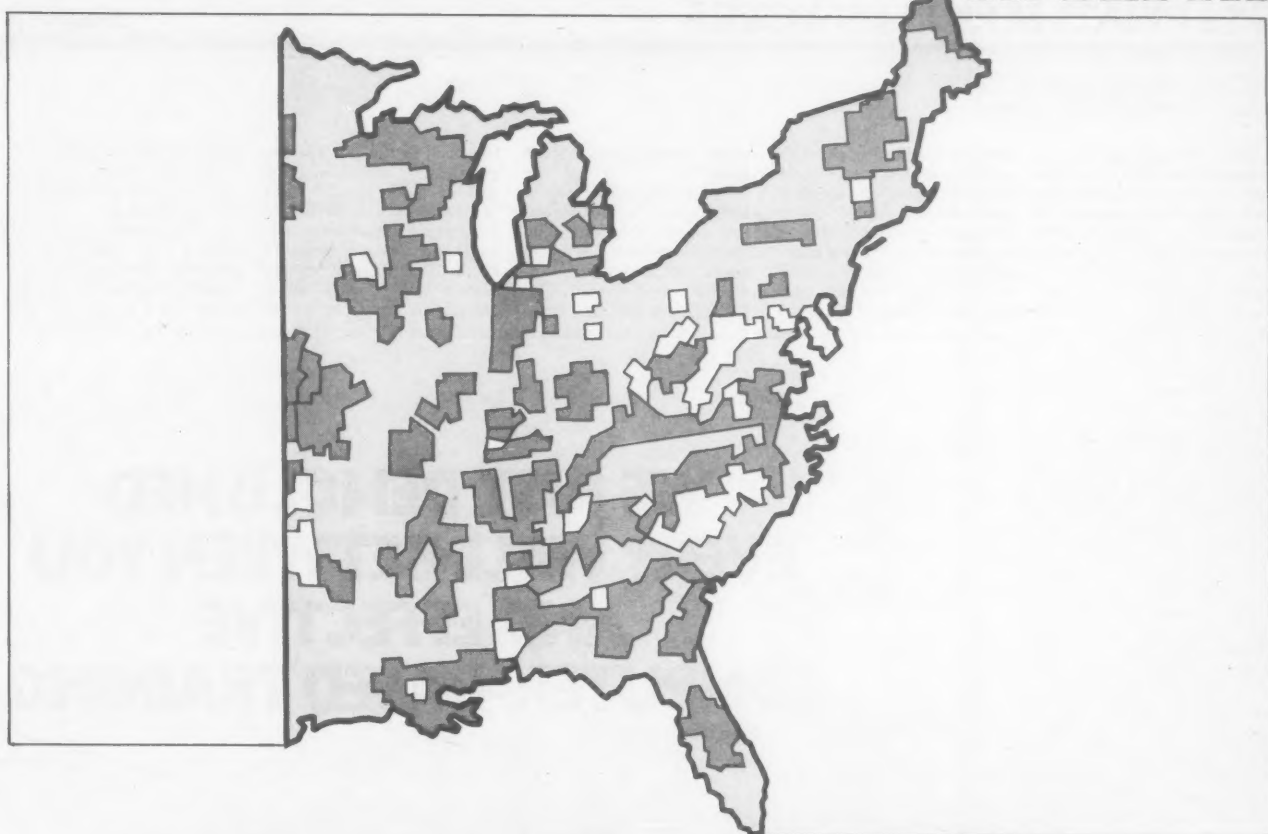
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## Mapping for Decision Makers

By Richard L. Nicholson

Decision support systems have traditionally conveyed information in tabular form and have not been able to display geographic information as maps. In fact, graphics of any form have only recently been introduced into DSS. But large-scale interactive mapping systems can be developed to suit DSS applications.

Improvements to the user interface focusing on conceptualization and control aids should allow decision makers to use interactive mapping systems as decision support tools. Recent attempts at user-friendly systems such as the Domestic Information Display System (Dids) have shown that development work in this area is both feasible and justifiable. Development in the areas of low-cost inquiry terminals and improved command structures is needed to provide decision makers with a friendly user interface.

Any study of DSS and their relationship to mapping systems should begin with a definition of these two products. A DSS is an integrated system of computer-based products, both hardware and software, that is used by managers to aid their decision making in

semistructured decision tasks. A DSS does not replace managerial judgments, but instead aids the manager in making them. This focus does not mean that a computer system is incapable of supplying a single best answer to a managerial problem. If the problem at hand is highly structured and the associated decision-making process can be described in detail before the decision is made, then it is a programmable problem and the system can supply an optimal solution.

Examples of these structured types of decisions are the calculation of accounts receivable, budget analysis and inventory control.

If, however, the decision-making process cannot be described in detail because of the need for nonquantifiable data, then this semistructured decision cannot be made but can be supported by the computer system. Examples of semistructured decisions are the selection of industrial site locations, long-term forecasting and the determination of target product markets.

Large-scale interactive mapping systems are primarily designed to

## IN DEPTH

collect, manage and display geographical data. The purpose of these systems is not just the manipulation of maps, as is the function of automated drafting systems, but the management of a large geographic data base composed of graphics as well as attribute information. Every item of data in such a data base has, in some way, a spatial element that ties it to a geographic location.

This geographic association may take the form of a record describing a piece of equipment at a known location, such as a transformer for an electric utility company, or may be a collection of data describing a polygonal area, such as a tree stand for a forest products firm. Due to the interactive nature of these systems, they provide immediate on-line access to their data bases and should be able to support semistructured decision tasks that require geographic data.

Studies of the decision-making process and of existing DSS have shown that there are common requirements a DSS must meet in order to be effective. The four most often cited requirements are:

1. DSS must provide specific graphical representations to assist the decision maker in conceptualization and a frame of reference for using the DSS (maps, bar charts, histograms).
2. DSS must support multiple paradigms since different types of decisions require different types of decision-making processes.
3. DSS must provide memory aids to the decision maker (for example, an electronic scratch-pad, recall of past reports).
4. DSS must provide aids to help the decision maker control the DSS and facilitate its use as a decision-making tool (for example, English-language commands and error messages, menus).

A common thread running through all four of these requirements is the dependence upon a well-designed "friendly" user interface. The DSS field has stressed research and design on the user interface and has made recent advances toward developing user-friendly systems. Typically, 60% of the software for interactive DSS applications is devoted to code related to the user interface.

Large-scale interactive mapping systems, on the other hand, have not stressed

the user interface as strongly as DSS. Software for a typical interactive mapping application will only devote 35% of its code to the user interface. It seems obvious that if mapping systems are to function in a decision support role, the user interface must be

much more highly developed.

Due to the heavy dependence upon a well-designed user interface for a successful DSS, the majority of problems reported by current users relate to inadequacies in this area. For instance, exist-

ing DSS do not provide the graphical representations that decision makers need for semistructured decisions. Tabular data is entirely adequate as a system response to a structured decision process since a single best solution can almost always be repre-

sented in this manner.

However, when a range of alternatives is necessary as a system response, as is the case with semistructured decisions, the provision of graphical representation becomes paramount. If the decision has a geographic ele-

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ment, such as the selection of a new facility site, the graphical representation must be in the form of a map. This problem relates directly to the first requirement of a DSS: the need to provide specific graphical representations.

A second problem cited by DSS users relates to the general "user-friendliness" of the system. The target user for most DSS is the manager or decision maker. Logically, this person should be interfacing with the system directly, without the need for

expert advice or extensive training. This unfortunately is not always the case. Many managers employ a consultant or "middle man" to operate the system instead of using the system itself as a decision-making consultant.

This problem is especially

acute in instances where interactive mapping systems are being used to provide decision support material. Due to the complexity of the user interface, operators of these systems are almost exclusively individuals possessing a highly technical back-

ground, thus effectively eliminating managers as system users. This problem relates to the fourth DSS requirement: the need to provide control aids.

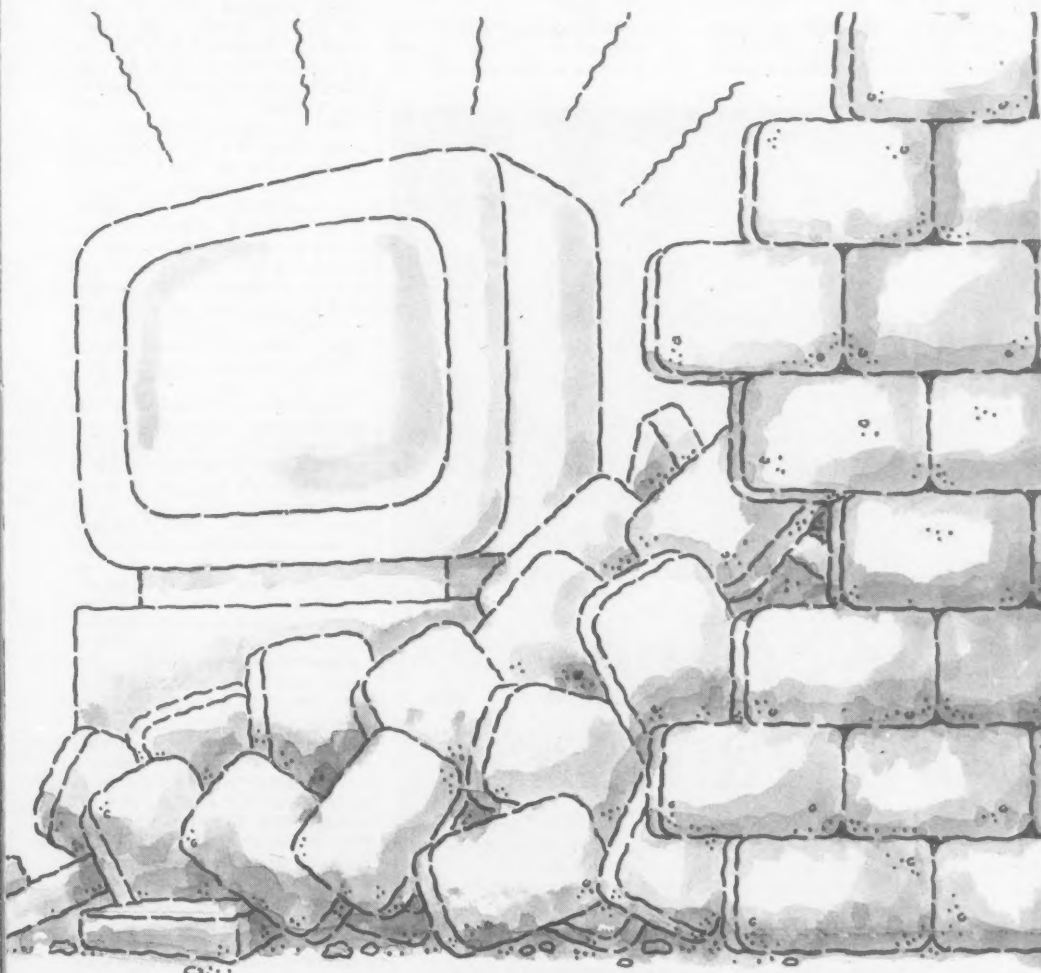
Interactive mapping systems can resolve some of the inadequacies of DSS simply by the fact that they are both interactive and able to display maps. However, in other aspects, they are greatly lacking as decision support mechanisms and need to be developed to meet the requirements of DSS. As previously stated, the requirement that a DSS provide graphical conceptualization aids has not been satisfied by most the current systems.

Interactive mapping systems are capable of providing the user with map displays on a timely basis and, if equipped with the proper software, can generate a full range of thematic and statistical (choropleth) maps.

Managers, when faced with a decision that is spatial in nature, normally use data presented in the form of maps, tables, graphs and pictures when analyzing the problem or selling the proposed solution to the affected parties. The decision maker carrying out these tasks is accustomed to working with ideas presented orally and in a written form on paper, transparencies and slides. If we want to design computer-based tools that will support the decision maker in these tasks, we must consider the characteristics of the intended user and the nature of the tasks carried out. Along these lines, interactive mapping systems must be given the ability to display bar charts, histograms, pie charts and other graphics familiar to managers in addition to the ability to display maps.

Most interactive mapping systems, whether by design or default, meet the DSS requirements of supporting multiple paradigms. A good DSS will not impose process upon the decision maker when a problem is semistructured, thus allowing the decision maker to arrive at a solution independent of system-induced bias. Many DSS ask the user explicit questions, the answers to which determine the next presentation.

Typically, there are far too many possible combinations of user actions to make a question-asking approach feasible. The ad hoc nature of queries and commands presented to users of mapping systems avoids this pitfall,



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although often at the expense of user friendliness.

The third requirement of a DSS, providing memory aids such as an electronic scratch-pad, can also be satisfied by interactive mapping systems. Systems organized in a manner similar to Synercom's Informat system, where there is a provision for separate working and permanent storage areas, are particularly well-suited to this task. Under this type of organization, the data base is kept in a permanent storage area in which the data can be viewed, extracted for

***A manager should be able to sit down at a terminal; query the system for a map using simple place names and terms describing spatial relationships such as size, distance, adjacency; and view the map on the screen. Currently, this ability is not possible with any widely available large-scale interactive mapping system.***

reporting and tabulation, or copied into working storage. No direct modification or editing of data is allowed

in permanent storage. Working storage functions as a scratch-pad area where copies of user-defined geo-

graphic areas in permanent storage may be placed. Once in working storage the data can be edited, added to, deleted and generally manipulated to test results of "what if" scenarios. Data in working storage can be saved for future reference or deleted after a conclusion has been reached by the decision maker using the system.

Providing control aids, the fourth requirement of a DSS, is an area where interactive mapping systems are in need of vast improvement. Much of the power of a well-designed user interface lies in the capability to present information in a variety of forms.

The same statistical data placed on a map, shown in a graph or shown in tabular format can lead to different user insights. Assuming that a user may want different representations of the same data at different times during the decision-making process, he needs a high degree of control over the presentations. This control must be "high-level" to be attractive to a decision maker since most do not want to interrupt problem-relevant thinking processes to cope with computer-imposed details.

High-level control can be provided through the use of English-language commands, menus or a combination of both. A manager should be able to sit down at a terminal; query the system for a map using simple place names and terms describing spatial relationships such as size, distance, adjacency; and view the map on the terminal screen. Currently, this ability is not possible with any widely available large-scale interactive mapping system.

Error messages are another aspect of the user interface that needs improvement. Managers quickly learn whether a system is a friend or foe when they make errors. A friendly system should give an informative message and provide help in correcting the error. Current use of error messages like "INVALID PARAMETER" means little or nothing to a manager, much less a programmer, and can be loosely translated as, "Something is wrong, and this is a wild guess at what it is."

Attempts have been made to overcome the aforementioned problems and develop a mapping-based DSS. One such example is the Domestic Information Display System, an interactive, menu-driven software system developed by the federal government. The system produces single and bivariate choropleth maps on color television monitors of socioeconomic data by county and congressional district at the national and state level and by census tract for standard metropolitan statistical areas.

The system is highly interactive and can produce a color map display within seconds of the selection of a data item from a menu. Continued use and evaluation has proven it to be a reliable and easy-to-use system that can be operated by nontechnical staff. The menu-driven user interface is easy to comprehend and simple to



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use. A voice can produce a meaningful map using the default parameters in a matter of seconds. More important, it is also easy to utilize the options to alter the color and class intervals, select windows on the data or highlight a particular class.

As previously stated, the decision maker must be given aids to conceptualize the problem, as well as control over system operation. These are paramount to the achievement of a friendly user interface. On a systems level, this interface can be viewed as a function of both hardware and software. The hardware aspect of the user interface may encompass a vast body of components, but for the purpose of this article will be limited to the terminal or workstation.

Virtually all of the large-scale interactive mapping systems on the market today supply workstations as

***A terminal for DSS applications needs to be smaller and less imposing than the typical workstation. Ideally, it should be desktop size, fitting easily in the decision maker's office environment.***

large number of terminals can be supported without significantly degrading the overall system performance. Since the terminal will not be used for data entry or editing, but

will be used to query the data base, a digitizing table is not necessary. However, some form of graphics input device such as a lightpen, joystick or mouse is required to allow

the user to interact with the system through use of graphics menus.

Finally, the terminal must be relatively inexpensive. In today's market a typical workstation can range in cost from \$50,000 to \$100,000. A realistic cost goal for a DSS terminal would be \$5,000, with \$10,000 being the upper limit based on the amount of local processing involved. A terminal with the capabilities described above, when integrated with an interactive mapping system, could easily satisfy the hardware requirements for a user interface that is

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the primary, and often the only, interface between the operator and the system. These workstations are designed for a specific purpose: the entry and editing of a geographic data base. They are also designed for a specific type of operator: an individual with a technical background who is familiar with concepts common to the fields of cartography and drafting.

A typical workstation consists of a digitizing table or tablet, a free-floating cursor, a keyboard and two CRT monitors. Recent products have relied upon high-resolution color raster monitors and have included local processing capabilities to offload the CPU. These workstations perform quite well within the bounds of their designed tasks, but are not suited to the type of user interface required of a DSS.

A terminal for DSS applications needs to be smaller and less imposing than the typical workstation. Ideally, it should be desktop size, fitting easily in the decision maker's office environment. It need not feature the sophisticated display capabilities of a typical workstation, but should include a low or medium-resolution color raster monitor on which text and graphics can be easily overlaid.

Like the workstation, the DSS terminal requires local processing capabilities to provide fast response times and the ability to operate as either a stand-alone system or in a network with the main CPU. In this manner, a

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*Managers will not use the decision support resources of a mapping system unless the command structure is clear, concise and easy to learn. The use of menus is one method of providing this type of command structure. Although mapping systems now provide menus, they are still only rudimentary.*

friendly enough for use by managers.

Many companies in the computer mapping industry are currently developing low-cost inquiry terminals that conform to the definition of a terminal for DSS applications. While this move is encouraging, development of software for the user interface is lagging far behind development of hardware. Of course, in some respects, software is more critical to the provision of a friendly user interface than is hardware.

Managers will not use the decision support resources of a mapping system unless the command structure is clear, concise and easy to learn. The use of menus is one method of providing this type of command structure. Although mapping systems currently provide menus, their development is still at a rudimentary level.

A successful menu approach should be based on a hierarchical tree structure such that the first menu displayed is the most general and allows the operator to select a number of more specific submenus. Each successively lower branch on the menu tree would allow the operator to specify more detailed or application-specific commands. Many software packages for personal computers have taken this approach and

have proven to be effective in providing a friendly user interface.

Another type of command structure that has been ignored by the computer mapping industry is the use of English-language commands. Commercial software packages for data base management systems typically take this approach by providing a conversational command language that allows the user to retrieve information, design reports and perform arithmetic operations, all with simple English-like vocabulary and syntax.

Common commands in a data base management system such as SELECT DATA FILE, DESIGN FORMAT and CALCULATE could easily be applied to a mapping system. Users would then be able to select a given geographic area of interest, choose the colors and symbology for a display and retrieve statistical information based on the nongraphics attributes in the data base. A conversational tutorial, similar to the computer-aided instruction course offered by Digital Equipment Corp. and other suppliers of commercial software packages could be used to teach the manager how to use the mapping system in a self-paced, friendly way.

The computer mapping industry is presently facing the challenge to develop large-scale interactive mapping systems that can be used as decision support tools, as well as for collecting and managing geographic data bases. Research conducted within the management science discipline has pointed the way for this development and has supplied a wealth of information on the requirements for a successful DSS.

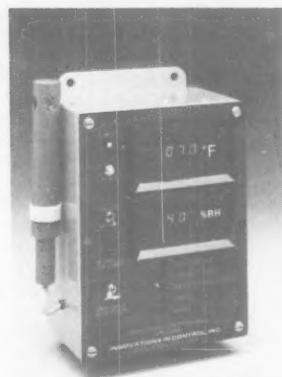
By studying the problems encountered by current DSS users, the mapping industry can avoid many of the common pitfalls attributable to a poorly designed user interface. Pilot projects and studies such as Dids support the premise that the use of mapping systems in a decision support role is not only feasible, but attractive to the user community as well.

#### About the Author

Rick Nicholson is senior systems consultant for the marketing division of Synecom Technology, Inc., a Houston-based vendor of mapping information management systems.

He holds a master's degree in geography and is currently involved in design and development of mapping applications for the telephone industry. He previously published "Redistricting Cities: The Case of Buffalo, N.Y." for Ontario Geography.

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# Batch and On-Line Security — One Roof or Two?

By William Pollack

Special to CW†

There are trade-offs involved in combining both batch and on-line security under a single roof.

One of the primary decisions that must be made when IBM CICS users evaluate security products is whether to purchase one package for batch jobs and another for CICS, or to attempt to incorporate all security needs under the aegis of a single product. The vendors that claim to address both batch and CICS security within a single product require IBM's VMS operating system.

The acquisition of a single software product for both batch and on-line use presents some obvious benefits. It is certainly more convenient to evaluate, purchase, install, maintain and support one product as opposed to two. Even when two products are involved, it may be easier, and probably less expensive, to deal with a single vendor than to purchase a batch system from one vendor and CICS security from another.

On a day-to-day basis, a single security package should be easier to maintain than two separate ones. In those cases in which a new resource was being added, a single security system maintenance update might be simpler to coordinate and less prone to error than two changes. However, upon closer examination of secured resources, this advantage is illusory.

Clearly the most sensitive resources in most data centers are direct-access files. Without proper security safeguards, anyone can read or

BATCH	CICS
<ul style="list-style-type: none"> <li>• Dasd Data Sets &amp; Data Bases</li> <li>• Programs</li> <li>• TSO Users</li> <li>• TSO Terminals</li> <li>• Job Accounting</li> <li>• Tape Volumes</li> <li>• Cataloged Procedures</li> </ul>	<ul style="list-style-type: none"> <li>• CICS Data Sets &amp; Data Bases</li> <li>• Transactions &amp; Programs</li> <li>• Users</li> <li>• Terminals</li> <li>• Times of Day</li> </ul>

## Batch and On-Line Resources

update any disk data set. For batch, IBM Vsam passwords can address this exposure at open time.

However, all files that are defined to CICS are usually opened automatically at initialization time, and the protection that Vsam passwords can provide for batch jobs is not available to CICS.

In this case, password protection or a batch security product must safeguard every existing direct-access file to prevent jobs from illicitly updating them. A CICS security product, on the other hand, need only concern itself with those data sets which have been defined to CICS in the file control table or through a data base interface. Only the CICS data sets are common to both security environments.

Furthermore, the desirability of protecting CICS files within a batch security system is not as significant as it may seem.

Perhaps a payroll file, for example, should be read and updated on-

line, but backed up in batch.

The uses of the file (read, browse, update, add, delete, allocate, purge) may vary from batch to CICS. Why permit centralized jurisdiction over both batch and on-line uses of the file when their respective functions can be completely independent? The single roof can be more of a headache than an advantage.

## Grouped Into Transactions

CICS programs, which are grouped into transactions (the equivalent of batch jobs and steps) are written exclusively for CICS. There is generally no single program that will execute in batch mode as well as under CICS. That means there is a common resource name, "program," but in fact, there are no programs that are common to both batch and CICS.

In this case, there is no advantage in having a centralized security maintenance procedure. Just the opposite may be true, as a generalized

system's maintenance may be more cumbersome than one designed specifically for batch or CICS.

There is a clear distinction between batch and CICS programs, so there is no need, and certainly no benefit, to securing them within a single product. When a batch program is added, batch security should be updated. For CICS, the new table entries can be coordinated with a CICS security update. The program and security modifications for batch and CICS are independent of one another and should be kept that way.

Typically, on-line users are assigned names and passwords in advance, which must be supplied in order to sign on at a terminal. Once the sign-on sequence has been successfully completed, a security package can monitor the resources that the interactive user is attempting to access.

While it seems as though we now have a common set of requirements that can be advantageously administered under one roof, this simplistic theory breaks down in practice. Even when a single person is authorized to use both IBM's TSO and CICS, the name and password are not necessarily the same for the two systems, and the capabilities are certainly different.

The sensitive files, programs and other protected resources that a TSO user must be prevented from accessing are undoubtedly disjointed from CICS files and programs. Even terminals are likely to be dedicated to TSO

(Continued on SR/6)

## Inside

Maintenance Seen Key  
To Preventing Data Loss .....SR/3

Programs Seen Vulnerable  
To DP Piracy .....SR/15

Computer Investment Seen  
Jeopardized Without UPS ...SR/21

Distributed Processing  
Holds Key to Security .....SR/8

Encryption Seen Effective  
In Shielding Net Intrusion ..SR/16

Security Seen Problem  
Of Business Management ...SR/25

Personnel Security Policy  
Critical to Dispel Risk .....SR/9

Planning for Recovery  
From Micro Disaster .....SR/17

Survey: MIS Should  
Shoulder Security Burden ...SR/26

Jargon Identifies  
Criminal Data Access .....SR/11

Micro Protection  
Involves Physical Security ..SR/18

Testing Seen Integral  
To Disaster Recovery Plan ...SR/27

Environmental Control  
Could Save Millions .....SR/13

Disaster Cases Show  
Need for Recovery Plan ....SR/19

Trade-Secrets Thefts  
Prompting Tight Controls ...SR/29



## Start With Media Maintenance Plan

## Maintenance Seen Key to Preventing Data Loss

By James R. Armstrong  
Special to CW†

The loss of corporate data can be rightfully termed a disaster. Depending on the degree, it could force a company out of business or could put a heavy strain on the company's resources.

Businesses, in most cases, carry insurance for the most obvious disasters, such as fires, floods, earthquakes and storms. There is also insurance for business interruption. These are all good coverages and are necessary for a company's survival.

But there are computer-room disasters that happen every day. These disasters come in the form of a "head crash," a dropped disk pack or cartridge, a cinched or stretched tape or a scratched tape or disk.

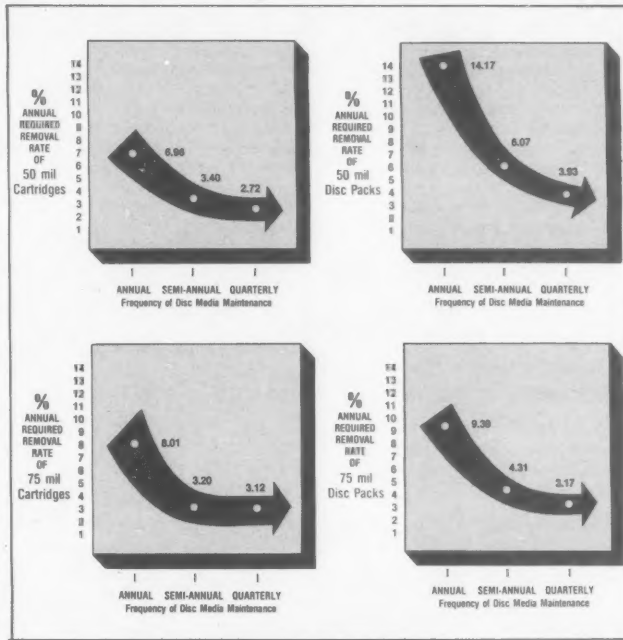
## Maintenance Comes First

The best data recovery plan starts with maintaining media. In most cases, very little thought is given to making sure that data needed for recovery is there. This protection starts with establishing a recording media maintenance plan.

Magnetic recording tape used on many systems requires maintenance. There are various types of tape cleaners and tape cleaning services. This type of equipment and service provides a degree of protection.

But tape maintenance involves more than loading a reel of tape onto a tape cleaner and waiting for it to cycle its way through the reel.

The tape should be checked to verify that the components are within physical specifications. Often, flanges on the reel crack or are



Benefits of Disk Maintenance

Source: Scopus, Inc.

chipped. This causes problems when the tape is wound.

When the layers of tape are wound incorrectly, they press against the side of the flange, causing edge damage to the tape. This damage can be multiplied if the flanges have a crack or a chip. Reels with defects should be replaced before they cause problems.

Tapes also require some sort of container to protect them from dust and contaminants in the air. These containers come in the form of canisters, seals (wraparounds) or automatic-load tape cartridges.

Many times, these containers are overlooked as the source of contamination. However, they do pick up and hold debris, which is then trans-

ferred onto the media.

All tape containers should be inspected to see that they are clean. Containers not meeting specifications should be discarded.

A high percentage of media problems is caused by the operator or the equipment. Improper maintenance of tape drives can cause innumerable tape problems. These include scratching the tape and cutting the edges.

Operators who mishandle the media are another problem. Most suppliers offer "care and handling seminars," which are designed to help train the operators. These seminars are usually given to employees at work and are often free.

## Essentials for Plan

Operator training, media maintenance and drive maintenance are essential to the formation of a good disaster plan.

Head crashes, perhaps the most dreaded media problem, can in most cases be prevented by proper maintenance of the recording disk. The disk pack or cartridge is extremely sensitive.

The sensitivity of the disk pack or disk cartridge demands that special precautions be taken in handling this media. Operator mishandling or contamination will result in damage to the disk. This can be disastrous because the data, in most cases, is immediately lost.

Hard disk media that does not meet vendor specifications will cause a malfunction of the recording heads, which can result in head-to-disk interference. The head crash will result in loss of data and downtime on the disk drive.

## Media Storage

Media storage is another problem. The cost of establishing a secure, environmentally controlled, fire-protected, off-site storage facility has become prohibitive to many companies. There are companies that provide shared facilities for media storage.

The operations manager considering such a service should look for a secure building that is equipped with a complete security system, including a Halon fire suppressant system and an intrusion alarm system.

The facility should also be manned around the clock and environmentally controlled for temperature and humidity.

It should have a controlled system for the deposit and retrieval of media and a courier service for regular pickup and delivery.

In addition, the facility must provide for emergency delivery of media within an agreed retrieval time (usually two hours). The transportation of emergency media should also be made in secure, environmentally controlled vehicles. The off-site storage company should provide a monthly inventory of all media storage.

Armstrong is president of Scopus, Inc., a Lowell, Mass., media storage firm.

## Making Plans for DP Disaster Recovery Requires Special Insurance Coverage

By Jack M. Gross  
And Alvin Arnell  
Special to CW†

More than 90% of all companies that manufacture and/or depend on data processing systems and experience a serious interruption or injury to their DP operations go out of business after the loss, according to a recent survey conducted by the Chubb Group of Insurance Companies.

A financial institution transfers over \$8 billion dollars a day, and a disaster within its computer operation could result in the loss of hundreds of thousands of dollars in applied interest. More important is the potential loss of thousands of customers who could not depend on the facility's services. Then there is the cost of maintaining and utilizing a "hot" site from the moment the disaster occurs.

Using these figures as a yardstick, evaluate the potential loss to your company in the event of a disaster to your computer system. The loss does not mean dollars alone; the loss of the special services and goodwill you provide customers and the inability

*'Each level of computer system insurance requires a special approach in determining the correct coverage. Minicomputer installations are not insured in the same manner as mainframe installations.'*

to deliver merchandise all have an impact on your ability to stay in business.

The risks call for special considerations and coverage by management. General liability, all risk and business interruption insurance do not cover actual computer systems or products. Nor does general liability coverage protect hardware or software or the expenses necessary to recreate vital documentation and software programs.

The risks unique to DP operations require special insurance coverage. DP insurance has to be custom-designed to suit your specific activities and installation, whether on-premises or off-site. Property insurance that covers factory equipment, typewriters, file cabinets and desks does not cover the intrinsic problems of computer processing.

Each level of computer system insurance requires a special approach in determining the correct coverage. Minicomputer installations are not insured in the same manner as mainframe installations.

Quantifying the attendant loss of software, operating systems and data is far more difficult. Your company may have spent years enhancing computer programs, and the personnel-hours necessary to recreate software and programs are many. Most policies will only pay for the blank media loss (a new tape, disk pack or raw film in the case of micrographics) and do not cover the cumulative value of the data stored. Standard policies do not cover the research and programming that would be required to recreate the programs.

(Continued on SR/6)

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# DP Disasters Call for Special Insurance Coverage

(Continued from SR/3)

A third generation of the backup cycle, stored off-site and recycled frequently, reduces or eliminates the vulnerability and costs of creating anew, thus minimizing the risks inherent with on-site storage, whether the storage is in the same structure or in another of the

company's buildings.

Most insurance companies will reduce premiums if a third-generation set is kept at an off-premises location that is not subject to employee manipulation or computer center disaster. The *EDP Examiners Manual* specifically states that all financial institutions should operate on a

three-cycle system.

Computer theft and infidelity is a separate contract and is usually added on to the basic all-risk policy as part of the total insurance plan. Theft and manipulation of data have become greater hazards since the decentralization of computers and the proliferation of mini

and micro units that can be readily accessed.

Professional liability protects companies providing DP services to customers. It is a separate and unique category of insurance risk coverage. Service bureaus, software developers, hardware manufacturers, consultants and systems designers have

to be protected from malpractice suits filed by dissatisfied clients.

Part of this professional liability coverage is for "errors and omissions," errors in programming that accidentally erase programs or data.

Before insurance is purchased, management should attempt to assess the hazards and the potential dollars at risk vs. the costs of insuring equipment and facilities, employee fidelity, media reconstruction, extra expense, business interruption, errors and omissions, loss of items in transit and liability to customers as a result of electronic funds transfer activities.

With estimates of these costs, management can make reasonable decisions regarding the types and amounts of insurance to carry.

Gross is a partner in Jess E. Gross Co. of New York; Arnell is president of Vault Management Corp., Garden City, N.Y.

## Trade-Offs Involved In Security

(Continued from SR/2)  
or CICS. Thus, the rules or "user profiles" that pertain to TSO and CICS will have little, if anything, in common. Therefore, there is no reason to combine their respective security definitions.

The remaining entries that appear in the accompanying chart (see chart on SR/2) are unique to batch or CICS, and there is certainly no benefit in having them protected by an integrated security system.

Batch jobs can be verified (and billed) by the accounting field on the job card, which has no meaning for CICS.

Tape volumes and cataloged procedures are also unknown to CICS users. Of course the CICS job itself can be protected by batch security rules. On the CICS side, time of day is especially critical in an interactive system, so it must be a resource that can be protected.

In summary, there is a great disparity among those resources that must be protected by batch and on-line access control systems. One of the presumed advantages of a single security mechanism — the ability to maintain resources centrally — becomes a myth. Only the single vendor and reduced price remain as benefits.

Pollack is an assistant vice-president for On-Line Software International in Glen Ellen, Ill.

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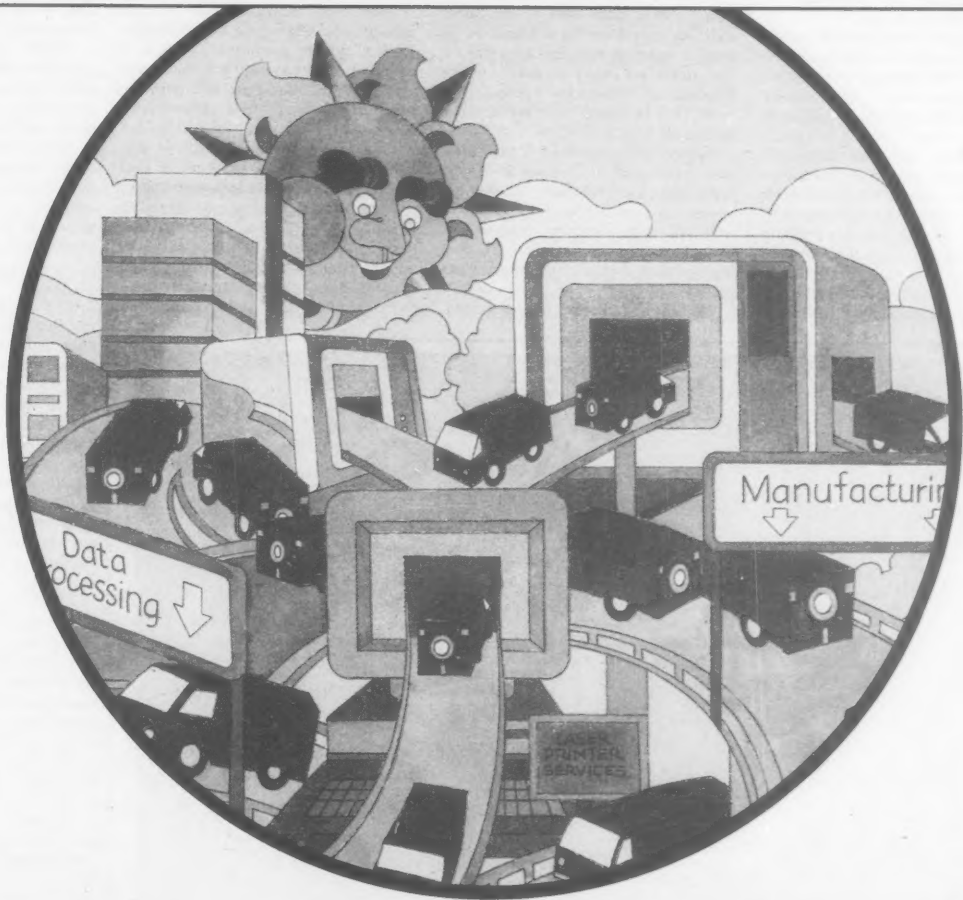
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# Distributed Processing Holds Key to Security

By Raymond W. Marshall  
Special to CW†

Today, more users have direct access to microcomputers than ever before. While microcomputers often improve productivity, there can be side effects that jeopardize corporate data.

First, there is the proliferation of those talented, creative computer dabblers known as "hackers," who attempt to — and often succeed in — penetrating data security by tapping into the computer files of numerous corporations.

Second, with the popularity of the personal computer and use of floppy

disks, it is very easy for a corporation's entire data base to go home with an employee in a briefcase or even a large pocket. Even in the office, there are many possibilities for damage, at enormous replacement costs, if it is possible to replace the data at all.

Capitalizing on micro proliferation is the goal of thousands of corporations. The ultimate challenge, however, may be tackling the erosion of data security procedures. However, there is an approach that can make this challenge more manageable.

The answer is a single, integrated,

controllable distributed processing system that combines the best of present and emerging technologies. Such a system provides a link to a corporation's remotely placed micros and minis through a reliable communications network to a central host processor.

One of the major benefits of distributed processing systems is that they permit fast, inexpensive processing of data at the place where the work is done. This allows more frequent generation of control totals to ensure that files are in order. The control data, transaction files and their modification history can then

be transmitted by each separate function to the host computer for further processing.

Another advantage of this configuration is that no part of the distributed system contains the company's total information picture for perusal by unauthorized personnel.

At the central host, the system accepts transmissions from each separate company function where it can test the modification history to ensure that the correct programs were used to generate the control totals.

## Host Program

The central host program can then conduct total cross-checks on the data submitted from the separate functions at the distributed processing sites and generate trial balance information. The central host program is the sole place where consolidated data resides. Strong data security measures can be employed to restrict access to that data.

For users who decide to invest in a distributed processing system, there are several points that should be investigated to ensure that the system is secure.

Physical security must be stringent and comprehensive. A crack security team should guard the equipment around the clock. Extremely tight controls should monitor all entrances and key areas. Fire and intrusion monitors should be directly wired to local fire and police stations. An auxiliary power supply should be used when outside power goes down.

The same intense security should guard telecommunications systems. For example, at General Electric Information Services Co., we monitor our network around the clock, constantly scanning to be sure that everything is working as it should.

## Tight Data Security

Tight data security is absolutely paramount. Users should be provided with a variety of protections including project and user identification, passwords and encryption, to name a few. Hiring an outside expert to test the security of your system should also be considered.

An unconstrained storage supply is essential. Not only must the capacity stay well ahead of the demand, but the equipment swaps should be done so delicately that there is no interruption or inconvenience to users with critical business programs.

Scrutinize the reliability of potential networks. They should have the capacity of handling present and future traffic, without any interruption and loss of data en route. They should be operational during normal business hours, including the office hours of facilities in other time zones. Be sure the network has the flexibility to accommodate your corporation's existing investment in hardware and software.

Finally, the increasing popularity of micros and minis dictates that the distributed system should be able to accommodate a wide range of terminal devices. The goal should be the

(Continued on SR/9)

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## Every Employee Seen as Possible Threat Personnel Security Policy Critical to Dispel Risk

By J. Van Duyn  
Special to CW†

A realistic appraisal of information security risks inherent in any corporate data processing environment is not complete unless it includes personnel security risks. These risks include every DP employee, ranging from data entry operator to maintenance programmer to management information systems (MIS) manager and director.

Sophisticated physical monitoring systems, security guards, effective systems and applications programmer, encryption and internal and external DP auditors make it more difficult for a potential computer criminal to commit fraud, embezzle, sell confidential information, steal CPU time or sabotage the system.

But it is not enough. Unless there is a definitive and enforceable personnel security policy — based on management philosophy and covering everything from hiring, promotion, mandatory annual two weeks vacation to termination — no maximum or even relative information security can be achieved.

Granted that good human resources in the DP field are not easy to obtain; nevertheless, specific procedures for recruiting and hiring, which include conducting background security checks, must be established. Moreover, they are to be observed without exception even when the applicant is a highly valued DP professional such as an MIS manager, data base management systems administrator, systems programmer, telecommunications analyst or computer operations manager.

Three DP professionals — in two different cases — who worked at the DP facility of the University of Mary-

*'Unless there is a personnel follow-up system to ensure that employees' performances and skills are routinely reviewed, updated and considered in a . . . career path, there is always the probability that a disgruntled employee . . . will turn to some form of computer crime.'*

land Hospital in Baltimore were indicted in 1982 for computer-assisted embezzlements.

One case involved Eugene B. Slear Jr., the hospital's assistant director for DP finance and systems, and a member of his staff, Thomas M.

Boyle Jr., a programmer/analyst.

According to the indictment, Slear and Boyle set up a couple of fictitious accounts in the hospital's accounts payable program, and from February 1980 to March 1981 the pair obtained \$126,564. In addition, Slear accepted

\$41,095 in cash and merchandise as "gratuities" from a vendor to whom he awarded a \$60,000 software contract.

The \$126,564 embezzlement and \$41,095 bribery came to light when the hospital's external auditors, Coopers & Lybrand, audited the DP operations. Both Slear and Boyle were arrested in July 1981, and later both men were released on bail.

Subsequently, Slear was found guilty of one bribery charge on which sentencing is pending and is (Continued on SR/10)

## Distributed Parts Are More Secure Than the Whole

(Continued from SR/8)

ability to use a whole range of devices, from relatively nonintelligent printer terminals to CRT terminals, hand-held data entry devices, personal computers and intelligent minicomputers.

Software that allows files to be password-protected should be used to prevent unauthorized personnel from browsing through or modifying the contents of sensitive data bases. Better yet, encrypt the contents of sensitive files and transmit them in encrypted form from personal computers to host processors to prevent intentional or accidental in-transit eavesdropping.

Some degree of separation of duties can be achieved by using distributed software that supports individual user account numbers.

Marshall is senior vice-president, Technology Operations, at General Electric Information Services Co. in Rockville, Md.

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# Enforceable Personnel Security Policy Urged

(Continued from SR/9)

scheduled for trial Dec. 5 on a second bribery charge. Boyle, who pleaded guilty on Nov. 19, 1982, was sentenced Oct. 4 to an 18-month prison term, with eight months to be suspended, to be followed by five years of supervised probation.

Had there been a comprehensive personnel security policy in place, the hospital management could have avoided the financial loss and bad publicity. The fact of the matter is that if the hospital would have conducted a security check on the likable and knowledgeable Slear, they would have found that in 1973, he

was convicted and served a sentence in Baltimore County for embezzling from a large company where he worked as a bookkeeper. [CW, May 31, 1982].

Just a year earlier at the same hospital, Barry Wyche, a computer operator hired in late 1980, was charged with embezzling \$40,000 by submitting false invoices to the hospital's computer system [CW, Feb. 2, 1981]. He was caught by his alert supervisor in January 1981 and subsequently indicted, convicted and sentenced to serve five years in the Maryland Division of Corrections.

After Wyche was arrested, the

hospital officials were chagrined to learn that the man not only had a criminal record, but that he was on probation for an identical offense when he was hired by the hospital. [CW, April 13, 1981].

## Installed Security Checks

As is usually the case, after these two "incidents," the hospital hurriedly instituted background security checks for all its DP personnel and tightened the internal controls in its financial systems.

Now, a background security investigation that includes contacting the applicant's work references,

checking with the proper authorities (meaning the Criminal Records Clerk's Office) and verifying the applicant's school records will eliminate DP staff with criminal records and phony degrees.

However, unless there is a personnel follow-up system to ensure that employees' performances and skills are routinely reviewed, updated and considered in a well-structured career path, there is always the probability that a disgruntled employee (without any previous criminal record) will turn to some form of computer crime.

An example is Lloyd Benjamin Lewis, the assistant operations officer at a Los Angeles branch of Wells Fargo Bank. He funneled some \$21.3 million out of the bank (between September 1978 and Jan. 23, 1981) and into the hands of his mentor, Ross Eugene Field, also known as Harold J. Smith. He was able to accomplish this grand embezzlement by "fooling" the bank's computer system and also by not taking a vacation for over two years — something that went unnoticed by his superiors.

On Feb. 3, 1981, Lewis went to the nearest Federal Bureau of Investigation office and turned himself in. On June 1, 1982 Lewis was convicted and sentenced to five years in federal prison [CW, Aug. 17, 1981].

## Defines Policies

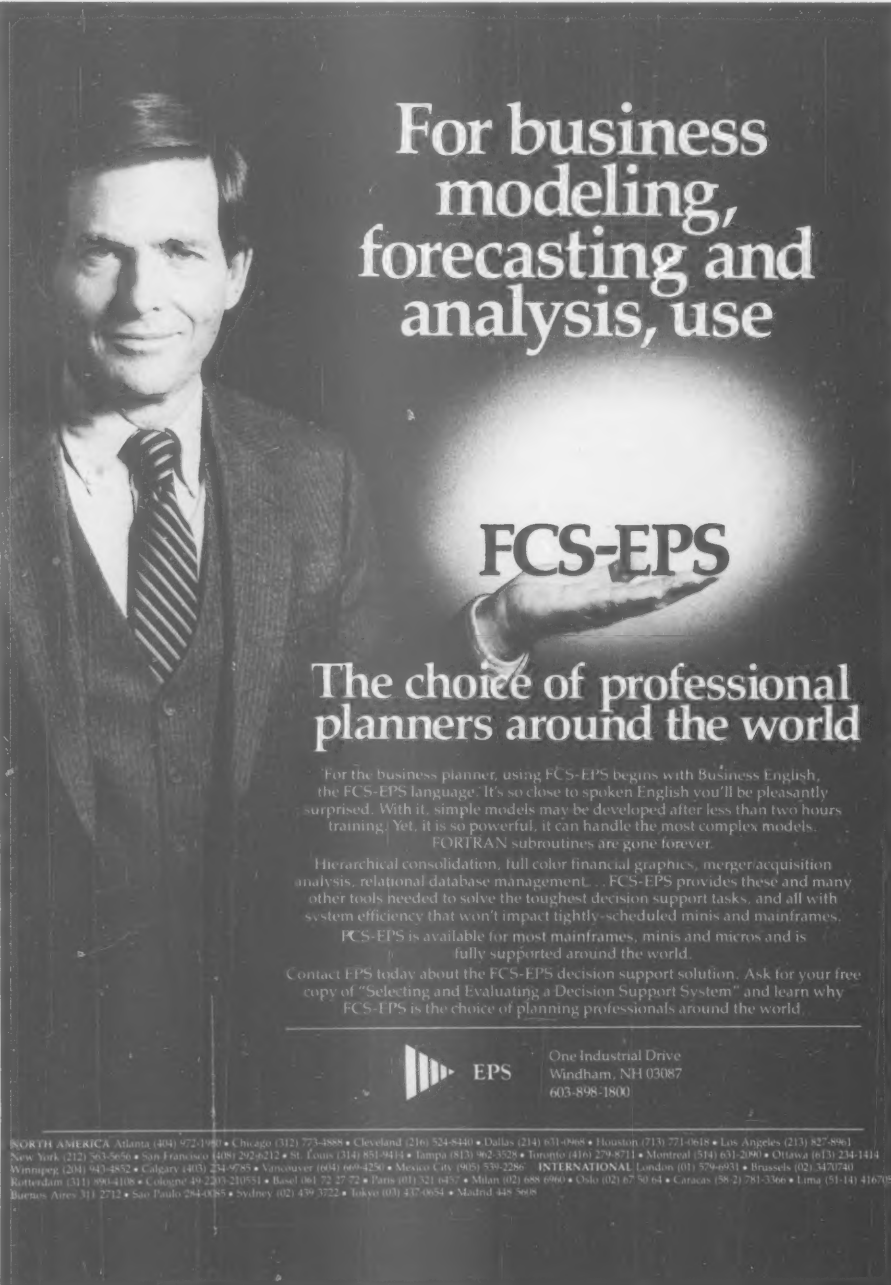
Furthermore, an effective personnel security and follow-up system does more than just prevent knowledgeable, productive DPs — who might possibly turn into disgruntled employees — to languish in low-level tasks. It also defines policies and procedures aimed at protecting corporate DP resources.

To begin with, it helps to have top management who is aware that DP personnel is one of the most valuable corporate resources and consequently is willing to view personnel as individuals rather than commodities. But if this prerequisite condition does not exist, it is up to the DP auditors and MIS manager to persuade top management to call in reputable management consultants who specialize in personnel security-related job evaluation/comparison systems to conduct in-house seminars.

The MIS manager can minimize, if not completely eliminate, job frustration and consequent possible security threats by communicating with his staff on a one-to-one basis. Thus, if a DPer shows any sign of discontent with the job by being absent too often or being persistently late for work or being less productive and/or less efficient than usual, the manager should talk to the employee as soon as possible. In the privacy of his office, the MIS manager can then try to find out what is bothering the employee.

And more often than not, the manager, by communicating directly with the person, has a good chance of resolving the problem and thereby removing a possible security threat.

Van Duyn is a DP management consultant in Loomis, Calif.



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## Jargon Identifies Criminal Data Access Methods

By Peter J. Haigh

Special to CW†

Computer fraud has already taken a \$100 billion toll on American business, and only 15% of detected frauds are reported to law enforcement officials.

Most computer crime involves neither technical sophistication nor modification of the actual programs. It is not the computer itself causing the problems; it is the lack of attention to what needs to be done in a changing environment.

As computer crime becomes more sophisticated, a new jargon has developed to identify various automated criminal methods.

Management should become familiar with these terms in order to identify and correct any potential problems before they become major disasters.

**Data Diddling** is by far the simplest and most common method used in computer crime. It involves changing data before or during input, which can be done by anyone having anything to do with creating, recording, transporting, examining or checking data.

For example, one might forge or counterfeit a document, exchange a valid computer tape disk or diskette with prepared replacements and neutralize or avoid manual controls.

**The Trojan Horse** method refers to extra statements being placed in a program so that the computer will perform unauthorized functions without altering those tasks for which the program was intended.

This is a very common method in computer-based frauds and sabotage and one of the most difficult to detect, requiring a very high level of technical DP knowledge.

**A Logic Bomb** is a set of instructions inserted into a program and processed at the appropriate time to execute unauthorized acts. In one case, instructions were inserted in the Trojan Horse method to reference the computer's day clock and execute on a particular date. When the date arrived, the instructions were activated, causing the erasure of an entire personnel file.

**Salami Techniques** are an automated form of crime involving the theft of small amounts of assets from a large number of sources. For example, with a demand-deposit accounting system in a bank, the program could be changed to reduce randomly

a few hundred accounts by 10 or 15 cents and then transfer the money to a special account where it can then be withdrawn through normal methods.

Transactions of this magnitude are generally not reviewed by anyone, and since everything would be in bal-

ance, there would be no indication of a problem.

The salami technique can also be used in conjunction with a rounding method.

For instance, when interest calculations or payroll deductions are done, the rounding is all put into one account.

**Data Leakage** involves the removal of data or copies of data from a computer system. Several techniques can be used to leak data from the computer system. In some sophisticated situations, data has been combined with otherwise innocuous data and removed from the facility.

On the other hand, where corporate executives or planners are using microcomputers for their short- and long-range planning, a general lack of security or carelessness could open the way for highly confidential data on diskettes to be purloined,

(Continued on SR/12)

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# Language Identifies Criminal Data Access

(Continued from SR/11)  
copied or lost.

**Scavenging** is a method of obtaining information from jobs left in or around the computer room. Physical scavenging involves searching through trash barrels for copies of discarded computer listings or carbon paper. More technical and sophisticated scavenging involves searching through residual data left in the computer after a job has run. For one reason or another, the data stored in this temporary storage area was not completely erased, thus making it available to the sophisticated scavenger.

Accessing these files now and again can result in some very useful information. Recently, at a time-sharing service in Texas, a computer operator noticed that one particular customer would always request a "scratch" tape be mounted on a tape drive.

When he mounted the tape, he noticed that the read-tape light would always come on before the write-tape light, indicating that the customer was reading data from a temporary storage tape before he had written anything on the tape.

After a while, the computer operator became suspicious and reported it to management. A simple investigation revealed that the customer was engaged in industrial espionage, obtaining seismic data stored by various oil companies on the temporary tapes and selling it to other oil companies.

**Physical Piggybacking** involves an unauthorized individual, usually with his hands full of computer tapes, waiting for an authorized individual to open the door to the computer area and then following him in. Turnstiles, man-traps or a station guard can prevent this, but are seldom used. (A man-trap is a double-doored closet through which only one person can move with a single-key action.)

**Electronic Piggybacking** involves issuing system access on the basis of a password or other protocols. The trouble begins when a remote terminal is connected to the same line as the on-site terminal through the telephone-switching equipment and used by someone other than the designated operator; the computer senses only one terminal and one "authorized" user.

Strictly enforced procedures for issuing, changing and maintaining passwords or protocols will help avoid

some of these dangers. Also, an automatic "time-out" of inactive terminals will help restrict access to unauthorized users.

**Superzapping** — Most computer systems have utility programs that execute quick fixes to data files or programs intended for use by key systems personnel. At

a New Jersey bank, the computer operations manager used this utility program to correct some errors (at management's direction) in the demand-deposit accounting system's program.

He discovered how easy it was to make changes and proceeded to do so on behalf of himself and several ac-

quaintances. By transferring funds from other accounts rather than making unilateral changes, the perpetrator was able to avoid detection until customers began noticing shortages in their accounts.

Does it appear that there are more issues than answers? Maybe that's because

the need for answers will only follow a need for these issues to be addressed. Controls that limit access and provide a means of detection will take time and cost money.

Haigh is director of management consulting services with Main Hurdman, Certified Public Accountants, in Pittsburgh, Pa.

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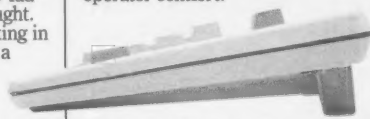
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## In Operational Downtime, Losses Environmental Control Could Save Millions

By Haus F. Levy

Special to CW

An environmental failure in an airline's reservations computer facility resulted in the loss of millions of dollars in a single day. A commodity exchange lost \$500,000 in a single afternoon due to com-

puter room downtime caused by a faulty cooling system. A stock exchange lost \$4 million in a single day for the same reason.

With computer room hardware and software costs now exceeding \$2,000/sq ft, an investment of \$4 million

for a typical 40- by 50-ft facility is commonplace. The potential loss of the use of a facility involving an investment of this magnitude demands careful selection of support equipment in order to avoid operational downtime and resultant

business losses.

Reliance upon comfort air conditioning or otherwise inadequate cooling, filtration and humidification can cause any one of a number of environmental failures with resultant computer and peripheral downtime.

These environmental failures include system safety shutdown; read/write errors; head-to-disk interferences; head crash; temporary or permanent chip failure; connector interrupts and short circuits from silver migration; tape surface deterioration; condensation within equipment; corrosion; gibberish processing; hot spots; gold scavenging and intermittent or premature failure of printed-circuit boards.

To avoid these problems, computer room environmental control systems should have high cooling and low moisture-removal capacities to meet or exceed the requirements of computer and peripheral manufacturers. Thus, the system should be capable of maintaining temperature and humidity consistently throughout the room, while keeping both people and equipment comfortable.

Environmental systems should also be modular, so as to be easily located or relocated for maximum efficiency and economy as dictated by reconfiguration and expansion of the computer room.

### Important Features

Wide-opening, easily removable doors to provide for quick service should be a design feature. System components selected for long life, such as low-vibration, fully hermetic compressors, are other features to be sought. Easy-to-reach components of standard, locally available design should be required, as well as a supplier with computerized access to records to afford speedy parts replacement.

Essential, too, are computerized controls that monitor and maximize energy savings. These should include fault-monitoring systems with memory and audible alarms along with temperature and humidity displays. Also highly desirable is a remote printer for hard-copy monitoring of all environmental operations.

One of the chief causes of computer room failure is reliance upon improperly designed environmental equipment. Yet avoidance of such hazards is easily accomplished — and with operating cost savings more than equal to the cost of the equipment.

For example, common electric or quartz humidifiers can cost as much as \$80,000 over a 10-year period. Task-  
(Continued on SR/15)

	ADM 11	ADM 12	ADM 24E
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Function Key Legends on 25th Line	From Host	From Host	Standard Non-Volatile
No. of Pages of Display Memory	1	2	2 or 4
Display Memory Configurations (Plus 25th message/status line)	24 lines by 80 characters	(2) 24x80 or (1) 48x80 or (1) 24x158	User-Definable up to 96x80
Scrolling	Standard Scrolling	Smooth, Jump or Horizontal Scrolling Split Screen	Smooth or Jump Scroll Split Screen
Transmission Mode	Conversation Mode	Conversation or Block Mode	Conversation or Block Mode
Editing	Limited	Full Editing & Protected Fields	Full Editing & Protected Fields
Visual Attributes: Reduced Intensity, Blink Blank and Reverse Video. Underline also on ADM 12 and ADM 24E	3 Embedded 1 Non-Embedded	5 Embedded or Non-Embedded, plus Full Screen Reverse Video	6 Embedded or Non-Embedded, plus Full Screen Reverse Video and Highlight
OEM Flexibility	Modifiable Set-Up Characteristics	Modifiable Set-Up Characteristics & Personality	Modifiable Set-Up Characteristics. Add to Program in ROM or Down-Line Load in RAM (56K ROM or RAM. Plus up to 22K Display Available) Room for add'l Logic Boards.

line print, transparent print, and display and print. There are four programmable function keys (shiftable to eight). And two levels of setup mode to reduce errors while still giving the operator maximum flexibility.

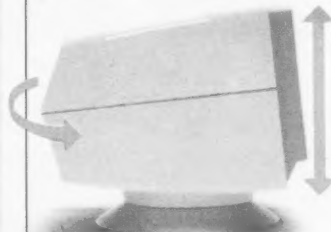
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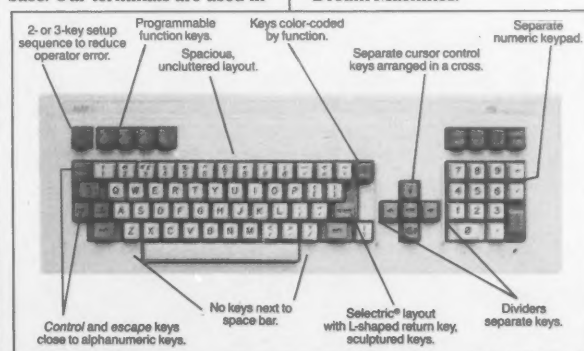


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## Socially Acceptable to Steal Software Packages Programs Seen Most Vulnerable to DP Piracy

By John Hurst  
Special to CW†

The concept of computer security, to most of us, automatically suggests the prevention of computer manipulation. There is, however, a much larger area of computer crime in our industry today and hence a much greater need for security to prevent such crime. This crime is the piracy of computer programs.

It is becoming obvious that some people who in their day-to-day lives would not consider stealing money or merchandise from a store have no such qualms about the theft of information. It has become socially acceptable to copy and use illegally programs and packages, which, if purchased, would provide income to their authors and developers. This theft has impact on the systems software house and on many end users who defray costs of development of a software package by selling it to other members of their industry.

But what can the developer really do to protect his investment? Recourse to traditional law enforcement does not appear to be the answer, nor do many of the often-tried protection schemes. Interestingly enough, the most likely opportunity for success in the protection of software appears to lie in a hardware

technique. An overview of the current protection methods will make this clear.

Copyright laws have thus far been virtually useless in guarding software. This is, to some degree, a result of the relative cost-effectiveness of pirating programs vs. stealing written material. A book is cumbersome and costly to photocopy and not worth the effort; computer programs, however, are typically designed for a more limited market than books and are more costly, and because they are read by a machine, they are simple to copy. The temptation is almost too great to resist.

### Overwhelming Problems

The temptation is bolstered by the relative impossibility of making copyright laws work for software. To date there has been no clearly successful copyright infringement suit because the problems are overwhelming. First, the program's developer must find the illegal copies; next, auditing every case of suspected piracy would be time-consuming, difficult and possibly not conclusive; and finally, even if the software developer has a clear "signature" in his software and can unquestionably establish piracy, it is unlikely that a settlement will enable him to recoup his

legal cost.

Other legal means of protecting software are very hazy. Contracts and licenses have been devised to intimidate would-be pirates and aid in their prosecution. It is not clear, however, to what extent such

schemes can be enforced.

"Public domain" is also an incipient problem the developer must face. Because knowledge cannot be owned, a developer must guard the source listings for his programs. If

(Continued on SR/16)

## Environmental Control Seen Key to Avoiding DP Loss

(Continued from SR/13)

specific process cooling with evaporative pad humidifiers can eliminate this cost entirely because no power is required, and compressor operation is decreased. Similarly, the use of electric reheat instead of "free" hot-gas reheat for dehumidification without cooling can cost upwards of \$30,000 over 10 years.

The solution is a task-specific system, which uses normally wasted compressor heat to eliminate these costly energy requirements.

Temperature zones in most parts of the country are below 50 F for at least half the year. Eliminate compressor operation during this period, as can be done with high-quality, task-specific environmental systems, and thousands of dollars are saved

each year.

For example, 10-year savings for a 2,000 sq-ft computer room typically range from \$150,000 to \$175,000.

After 17 years of experience in research, design and manufacture of environmental control equipment for computer rooms, AC Manufacturing Co. of Cherry Hill, N.J., calculates that the best quality, most reliable, specialized equipment costs about 1% of the investment for the cheapest air conditioner. And that 1% includes the required redundancy. Moreover, this small initial cost can be quickly recovered through energy savings from computer-controlled, state-of-the-art process cooling systems.

Levy is president of AC Manufacturing.

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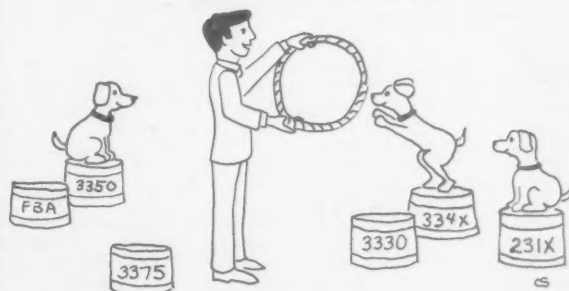
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# Encryption Seen Effective Shield to Net Intrusion

By Stephen W. Leibholz  
Special to CW†

Serious workers in the field of computer security now generally acknowledge that the most cost-effective means of reducing the vulnerability of commercial on-line computer systems is the encryption and/or cryptographic authentication of the data flowing over remote circuits such as telephone lines, com-

puter utility networks and packet nets.

The reasons are simple — communications circuits represent the least controllable and most accessible portions of a system, subject to random attack, sophisticated attack and plain old wiretapping; attack on a computer system via communications intrusion now represents fully one-half of the avenues of entry used by com-

puter thieves; and intrusion by communications entry is relatively anonymous, cheap, remote and — most importantly — difficult to prove.

Consequently, these serious workers, as a class, have come to recognize that whatever security and auditing software is incorporated in the host of a computer network, encryption and/or authentication of the communications is a sine qua non of effective protection. And passwords are of almost no benefit.

Recognizing this need for effective protection, the government responded several years ago with the release of the Data Encryption Stan-

*'DES [Data Encryption Standard] is the first thoroughly tested and demonstrably strong cryptographic technique for commercial applications which has survived the rigors of code breaking by some of the best mathematicians ... [but] the critics of DES are legion.'*

## Computer Program Piracy Seen Serious DP Crime

(Continued from SR/15)

they are released, the programs are in danger of becoming public property. Lawyers are busy advising clients on the correct messages to include in their packages in order to prevent the programs from becoming public domain; unfortunately, no two lawyers seem to have the same opinion on such disclaimers.

Those who develop programs have invented a number of in-house software and hardware schemes to secure their software. The methods vary considerably, but there can be little doubt that there are few areas of the computer business that have received such great attention.

One notable example of a protection system too complex to be effective is found in the so-called copy-proof formats. These formats have generally been designed for microcomputers and involve an obscure way of putting data on the disk, which would interfere with the standard copy program used by a pirate.

### Format Problems

The major problem with the formats, however, is that copying is also difficult or impossible for the legal customer, making systems backup very costly. And copy-proof programs are not unbreachable; the programs must be readable in order to be read into memory for operation.

A protection method that has become known for its use on the Digital Research, Inc. CP/M operating system is serialization. To serialize, some unused information is general-

ly written into the middle of the program, which allows tracing to the person to whom the copy was sold. The idea is to "intimidate" buyers, but it is very hard to prove that the buyer allowed his package to be copied. Also, it's hard to find the copies to begin with, and serialization is a relatively expensive procedure.

Signature techniques are software or hardware devices that are checked by the system in order to allow access. The most often-tried are simple code signatures, which must be entered from the keyboard to allow the package to run. These, however, can be easily distributed by the buyer of a package to someone he has allowed to copy it and, therefore, offer no protection from unscrupulous customers.

The best potential protection devices are hardware signatures. These "black boxes," which plug into the computer, are individual to each buyer, but are controlled by the software supplier. Thus, there is no danger of the software being copied since it will not operate without the epoxy-sealed key, and this key cannot be easily reproduced. At the same time, unlike copy-proof systems, the software can be copied by the authorized buyer.

These problems, however, look very small when compared with the far more insurmountable drawbacks of other methods. Hardware signature devices offer the software developer sure protection for a small cost.

Hurst is a senior member of the technical staff at Point 4 Data Corp.

## Data Encryption: How to Find The Right System

By Stephen Hicks

Special to CW†

Finding the right data encryption system is not hard. Computer security systems are ready now for practical implementation, and the information needed to evaluate them is easily obtained.

No coding system can solve every computer security problem, but many systems can help reduce headaches. A basic rule is to use conservative and easy-to-use codes that have withstood repeated attacks by experts. Avoid experimental codes or codes with secret algorithms.

Most commercial uses will require:

- A computationally unbreakable code.
- A fast, easy-to-use management system.
- Portability over different computer operating systems (including communications security).

• Security that is key-dependent  
(Continued on SR/20)

dard (DES) for commercial applications. DES is an encryption algorithm that uses both substitution and transposition to produce encrypted text from an original message. A 56-bit key (plus eight check bits) is used to control a given encryption.

DES is the first thoroughly tested and demonstrably strong cryptographic technique for commercial applications which has survived the rigors of code breaking by some of the best mathematicians in the world. Despite the fact that DES, as a mathematical technique, is far superior to other data protection methods presently available for commercial communications and networks and despite the fact that the computer security threat is growing at an exponential rate (approximately doubling every 2½ years) — the critics of DES are legion.

A frequent comment is that DES has been made deliberately weak. Commentators have hinted darkly at weak keys or "trapdoors," which, once discovered, will render DES as decipherable as "Run Spot Run." These commentators, some of whom regrettably have their own algorithms to put forward, are missing the point. There is indeed an Achilles' heel in many cryptographic protection systems, but it has nothing to do with the mathematics.

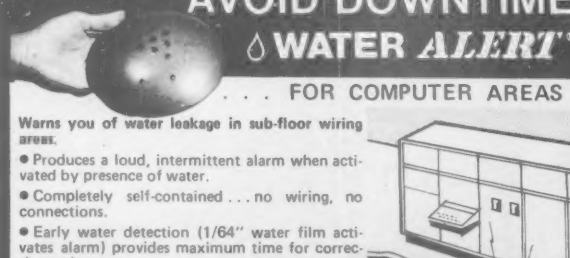
The 56-bit DES key represents a good design for commercial practice. Assuming that the cryptographic key is changed at least once a day, intruders would be faced with the task of testing 2<sup>56</sup> possible keys in less than

(Continued on SR/18)

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## Equal in Importance to Mainframe Safety

# Developing a Disaster Recovery Plan for Micros

By Chris Oakleaf

Special to CW†

Eventually it happens to everyone. You've been running for two hours without executing a save, and, whammo, the power fails, the line gets dropped, the system crashes, and you have to recover. So you reload what you were doing and start from scratch.

And how about the time someone dumped an ashtray with a lit cigarette into the trash. The printouts nearby went up in flames, and you had to have them reprinted.

Today, with the proliferation of personal computers, that trash fire could wipe out your inventory of floppy disks. If you have generated several trays of floppies and you expect to start from scratch, you had better realize that it will take you about as long to get where you are now as it took for you to get there in the first place.

Presumably you are in an environment with an existing mainframe. If so, your data center should, by now, have system backup and disaster recovery operations as a part of its day-to-day activity. The center at The Continental Group, Inc. in Stamford, Conn., does, so the company took advantage of existing mechanisms to provide the IBM Personal Computer user with disaster recovery, be it from fire, flood, sticky fingers or spilled coffee.

There are three pieces to

the mechanism that was put in place at The Continental Group.

The first piece is VM Personal Computing, Inc.'s VM/Relay. This provides a menu-driven capability for sending unconverted data through a Hayes Microcomputer Products, Inc. Smart Modem to the mainframe. It also receives unconverted data from the mainframe to reconstitute a file or program.

The second piece, also from VM Personal Computing, is called Please. It runs under VM/CMS, and will upload or download files with a minimum of effort.

The third piece was built in-house, using STSC, Inc.'s APL\*Plus. It is the controlling portion, which allows the user to track his storage and files. It allows the mainframe end to "talk" to the Personal Computer.

The menu system on the Personal Computer has an integrated Help facility so users may obtain immediate information on any portion of the system. The mainframe portion of the system also has an on-line Help facility concerning any portion of the system. The Personal Computer user may release the mainframe screen at any time to perform relay functions without losing the connection or continuity of operation.

A profile is provided to the user, which automatically dials the mainframe and loads the appropriate opera-

tion. The user is prompted to either "Backup," "Restore" or do "Housekeeping" against the files he has moved off the Personal Computer.

If he chooses Backup, he is transferred back to the micro to select the files he wants to move. The menu-driven system requires a minimum of key strokes to accomplish this. Once the files are selected and being sent, the user waits until he is prompted

for comments for the files as they are moved into permanent storage on the mainframe. These comments will provide him with a reminder later on, should he happen to forget what his file names mean.

Selecting the Restore option will allow the user to move files off the mainframe and back onto the Personal Computer. He does this using the same "wild card" ability that is available on

the micro. Files may be selected by storage date, by name or type or by a combination.

Again, once the user selects the files, the system moves them from permanent storage into temporary CMS storage and then downloads them to the micro.

If the user selects Housekeeping, he may list out the files currently in storage or drop those which are no longer of value.

Other considerations include the option to overlay files of the same name and type, under the supposition that the most current is the only one necessary. This is at the discretion of the user. Presumably, if he chooses not to overlay previous copies, then the comments will provide the vital information required to select the proper version to be restored.

While the system is fairly new, some users have already asked for an expansion that would allow them to move programs from one Personal Computer to another at various locations throughout the country. This provides a distinct savings over attempting to perform the same operation from Personal Computer to Personal Computer in terms of time and protection. For one thing, it eliminates the need to mail diskettes from place to place.

With the substantial investment being placed in the storage of data and programs on the Personal Computer, it is certainly at least as important to be able to provide disaster recovery for this level of system as it is for the mainframe.

Oakleaf is senior time-sharing analyst at The Continental Group.

## Contingency Planning Must Begin With MIS

By John P. Murray

Special to CW†

It seems unlikely that anyone who really understands the pervasive nature of the management information systems (MIS) function within an organization and the critical need to safeguard data and carry on data processing in the event of a disaster could be casual about the absolute requirement for a strong, regularly tested MIS contingency plan.

The reality is, however, that few organizations have effective MIS contingency plans in place. It is also unfortunate that the subject has very low priority in most MIS departments.

Until the person in charge of MIS decides to take appropriate action to put an MIS contingency plan in place, it is just not going to happen.

Developing an MIS contingency plan is not terribly difficult. It is also not terribly exciting. In

fact, the process is rather mundane, particularly when compared with the other duties MIS executives deal with on a regular basis.

In addition, the rewards associated with the successful completion of a contingency planning project are usually limited because the occurrence of a severe disaster is rare. Usually, the only reward is in knowing the plan is good and that it is in place.

The essence of success with MIS contingency planning is the same as with any other MIS project. The same project principles apply: Developing a commitment to the project, performing the appropriate planning and offering direction and control make the effort successful.

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(Continued on SR/24)

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# Micro Protection Involves Physical Security

By Richard Baskerville

Special to CW†

Security in small business micro-computer systems is often addressed only casually, if at all. Usually, the only security question raised during the introduction of the new micro-computer system is the issue of hardware failure. Rarely do issues of physical security or recovery from failures arise. Actually, the same techniques for protecting larger systems can apply to micros too.

Security of microcomputer systems revolves around physical security. While the system may be a desk-top unit, it can still be protected. The

placement of the unit in the office should be carefully considered. Wherever possible, it should be in a limited-access area. To the small

business, this could be a small room near the operators which can be secured when unattended. If this is not possible, a scheme should be devel-

oped which disables the system when unattended. This might be as simple as shutting off power and

(Continued on SR/22)

## Encryption Needed to Guard Networks

(Continued from SR/16)

24 hours; a theoretical special-purpose circuit capable of 100M bit/sec encryption could test about a million keys per second — about 86 billion transformations per day. But even this theoretical circuit falls short, by a factor of approximately a million, of the solution for a given key.

The weakness of some DES-based cryptosystems lies not in the mathematics, but in the implementation. The principal risk lies in the methods by which cryptokeys are stored and distributed. Any software implementation in which lists of key variables and other critical data can be accessed through the host computer

is automatically vulnerable to attack by time-honored methods.

Even more critical are the methods by which these variables are distributed to the remote users. Good discipline requires that the keys be changed every working day; further good network discipline assigns different keys to different users (or different groups of users).

Key distribution is a problem that can be solved by technical means. Unless automated, the management of keys represents an onerous, boring and expensive overhead activity; the hard reality is that key management practices can — and do — rapidly become lax, and the systems therefore become vulnerable.

One solution involves the principle of coordinating the cryptographic key variable on-line in a protected way. The technique operates as part of the fundamental communications protocols, but does not interfere with existing network protocols and is itself secure from interception by wiretapping or attacks upon the host computer. The Sherlock Information Security System utilizes a three-tiered key management structure and operates entirely electronically.

### Authentication Provided

Many user organizations do not require cryptographic protection of their data; in fact, the laws of some foreign countries specifically prohibit secret communications by commercial organizations. For these cases, the same process (and indeed the same hardware) that is used to provide cryptographic protection is used to provide authentication. Authentication of a message is the procedure necessary to assure that the message was indeed sent by the presumed station or person and that nothing was altered in the text.

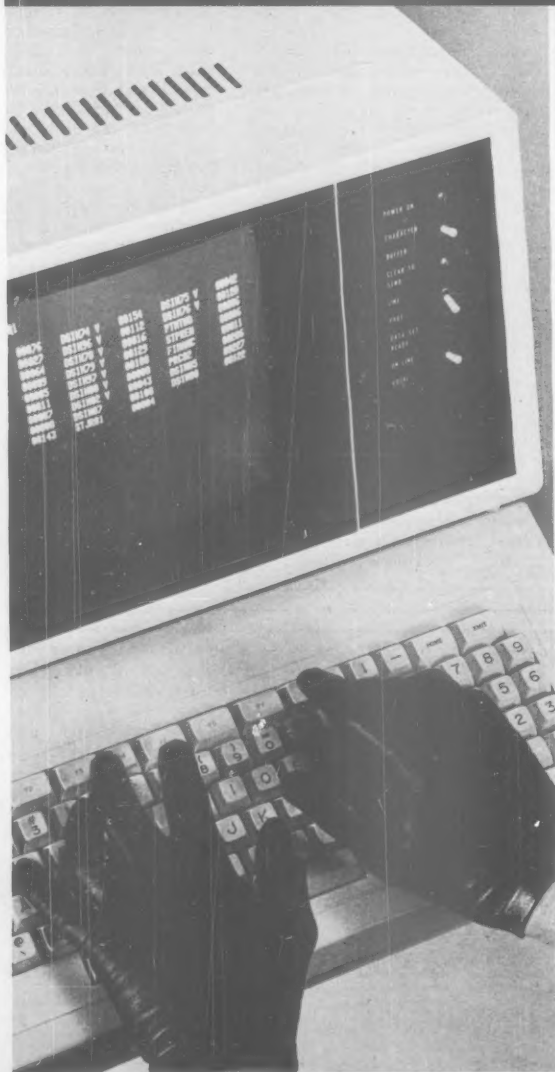
Security practice requires that every time communications are restarted — in the morning, as the result of malfunction or as a result of interference by an intruder — the cryptographic key or its equivalent should be changed. A well-designed information security system will, among many other subtle details of design, provide for this practice.

DES, properly applied in a communications and computer information security system, offers the most realistic promise of ensuring the integrity of processed and transmitted data in the commercial environment. The supposed "weaknesses" of the DES algorithm are in reality sins of naive application, and a well-designed information security system based on DES can minimize the disasters resulting from the growth of computer crime.

Leibholz is founder and president of Analytics, Inc. He is a member of the Army Science Board and the U.S. Naval Intelligence Advisory Group.

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## But Few Companies Have Them in Place

## Disaster Cases Show Need for Recovery Plans

Special to CW†

Although a major data processing catastrophe is something most organizations never experience, there are various degrees of severity for computer center disasters, ranging from temporary malfunctions of time-critical equipment to complete loss of facilities, equipment and records.

Disasters such as fire, flood, environmental problems, hardware and software problems and sabotage can and do happen. Unfortunately, management often tends to ignore these possibilities. If management reviews the impact of DP operations disasters and consciously chooses not to plan for such major disasters, then perhaps the risk is not serious enough to warrant taking precautions.

However, with corporate dependency on computer centers and information processing growing, the more typical situation indicates that when the computer center goes down, all company work is affected.

In today's competitive, fast-moving business environment, the importance of computers and information systems is quite evident. However, it is estimated that less than 50% of the Fortune 1,000 companies have plans in place to ensure continued availability of these valuable corporate resources. In addition, it is estimated that only one-half of the disaster recovery plans in place are workable. For smaller companies, the percentages indicate an even worse situation.

## Case Studies

Disasters occur infrequently, thus management may tend to underemphasize the immediate need for a recovery plan. The following three cases, however, emphasize the need for disaster recovery planning:

• **Company A.** A 300W light bulb was left burning overnight in a supposedly fireproof tape vault for a large government computer center. The ceiling material next to the light began to smolder. The next morning when a computer operator opened the vault door to retrieve required tapes, the oxygen from outside the vault caused a fire to ignite in seconds. Attempts to turn off power to the computer center failed because the only power shutoff switch was located in a remote area behind the fire. Fire personnel poured water on electrical equipment that was still running. Before the fire was over, the entire computer center was destroyed.

Three major problems contributed to this disaster. First, the material used in the vault should have been fireproof, not merely fire resistant. Second, the master electrical shutoff switch should have been located near an outside door. Last, the computer center should have been designed to allow easier access by fire personnel. Proper disaster recovery planning would have identified these problems.

• **Company B.** In the early morning hours, a fire started in the warehouse of a medium-size manufacturing

company. Before fire personnel arrived, the blaze spread to the administration building of the company. Upon review of the damage, the president of the company quickly realized that most of the company's accounting records, as well as all of the DP system, had been destroyed. The loss put the company out of business.

The major problem at this facility was the lack of a disaster recovery plan and the associated remote site storage of critical and necessary information. With the proper backup facilities and procedures in place, the

company could have survived.

• **Company C.** A machine caught fire in the production area of a small manufacturing plant. Because of the close proximity to highly combustible material, fire personnel reacted promptly and efficiently, dispensing thousands of gallons of water into the manufacturing facility. Water also flooded the adjacent administrative offices and the computer center. Fortunately, an alert computer operator followed the published emergency shutdown procedures, eliminating the potential for fire and

electrical damage in the computer room.

The next day, computer service personnel inspected all computer equipment, giving the go-ahead to start up the facility only eight working hours after the fire. Published and practiced disaster procedures prevented a crisis.

Examples of disasters and potential disasters reemphasize the need to establish a disaster recovery plan. An IBM study shows that over a 10-year period from 1968 to 1978 there were

(Continued on SR/21)



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# Finding the Right Data Encryption System

(Continued from SR/16)  
dent, not code-dependent. (In other words, only the keys and not the coding math need be kept secret.)

• Upward compatibility for future cryptographic developments.

In addition, larger applications may need central access control, network transparency and message authentication.

The first step toward meeting security needs is to decide which encryption system to use. The best approach is to opt for a code that has already been through fire. Codes that have survived repeated attacks by cryptanalysts and information theo-

rists merit confidence. It also helps if a code has passed through a standards evaluation process; this provides a public forum on its properties. Some codes have undisclosed cipher algorithms — avoid them.

Most codes currently available are either single-key (conventional) codes or double-key (public-key) codes. Single-key codes use only one key for enciphering and deciphering, while double-key codes use a separate key for each function.

A number of practical and computationally unbreakable single-key codes are available. Two prominent examples are the Data Encryption

Standard (DES), developed for the U.S. Bureau of Standards, and IBM's proprietary Lucifer cipher.

Both are product codes, combining several weaker codes into a single, very strong code. The only way to break a well-designed product code is to try every possible key so that a large enough key makes such a code computationally unbreakable.

The DES 56-bit key is suitable for short-term security. Long-term, archival or high-level security requires multiple keys and several passes through a DES chip. In 1976, Whitfield Diffie and Martin E. Hellman of Stanford University introduced the

public-key code, a concept that has helped shape modern cryptography. Arcane mathematical tricks let these codes provide secure data transmission between people who have never even met, much less exchanged, cipher keys.

To achieve this, the user makes public his enciphering key. Once a file is enciphered under the public key, it can only be deciphered by a separate and secret deciphering key. Since the enciphering key is public anyway, no one has to worry about compromising it. It can do several things single-key codes cannot: time-stamped public-key signatures on integrated circuits to fight counterfeiting; blind signatures for funds payments that can be made untraceable; general signatures for compiled computer programs.

## Authentication Problem

On the other hand, public-key codes do ultimately require as much authentication as secret-key codes. Some central authority must verify that the decoding key is not a forged version substituted by a clever opponent. In information theory, this is called the authentication problem.

A good automated system requires only that users pass the access procedures. The system itself should provide and protect randomized keys for enciphered data, keeping different classes of data (accounting, medical, engineering, source codes) separate under user control.

Protocols are the procedures and message formats used by various parts of the security system. Protocols can be complicated and should be handled automatically by the system.

Good solutions are available for most cryptographic problems, although no single approach will solve every problem. When evaluating candidate systems, it is helpful to isolate specific computer security needs into three categories:

• **Transparency.** A system should automatically encipher off-line media, such as tapes and disks, at the operating system level, deciphering files only as they are called out.

• **Individual encryption.** The ability to encipher any file at any time should be independent of the automatic function. This allows private data to be secured separately.

• **Communications.** This boils down to the problem of key transmission in an open network. In large systems, the number of keys quickly grows unwieldy so a user cannot rely solely on his data base. Reliable key communications can be achieved via a key distribution center. This concept is explained in a U.S. government patent (Rosenblum, Patent No. 4,182,933).

In summary, although cryptography is a rapidly expanding field, current systems will remain usable and secure in the foreseeable future. The current state of the cryptographic art is such that users can have confidence in systems now developed.

Hicks is vice-president of research and development with Cydat, Inc., Burlingame, Calif.

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## Without UPS, Computer Investment Seen Jeopardized

By Bob Martin  
Special to CW†

The capital investment in computer equipment is significant, and without a clean, uninterruptible supply of power to the system 100% of the time, that investment could be jeopardized.

An interruption of power can re-

sult in thousands of dollars in lost business, recovery time, equipment repair and re-entry of data. What is not so obvious is the potential for altered data files, which may have far-reaching results if undetected.

Many data center managers recognize that the uninterruptible power supply (UPS) system is the best method of protecting the investment in a computer. As the importance of reliable power becomes more evident to the data center manager, they are assuming more responsibility for selecting the power equipment for the computer room.

*'Buying a UPS is more than merely buying a box and plugging it in. Today's data center manager needs to select a vendor who he believes will take total responsibility for supplying all the power to the computer center.'*

Buying a UPS is more than merely buying a box and plugging it in. Today's data center manager needs to select a vendor who he believes will take total responsibility for supplying all the power to the computer center. Regardless of the manufacturer, most UPS systems fundamen-

tally operate in the same manner, although engineering technology differences will vary in operating characteristics and reliability.

A UPS consists of a rectifier, an inverter and a static switch. The UPS receives raw commercial utility power. (Continued on SR/26)

## Disaster Cases Reflect Need For Precaution

(Continued from SR/19)

more than 350 major DP catastrophies.

The most important element of any disaster recovery plan is the identification of critical company functions. The primary objective after a disaster should be to restore these critical functions. To accomplish these objectives, the designer of a disaster recovery plan must understand two things: the phases of events in disaster recovery and the key elements contained in a disaster recovery plan.

The five phases in disaster recovery are:

- Preparation.
- Protection.
- Recovery.
- Critical Operations.
- Normal Operations.

The key elements contained in a disaster recovery plan include:

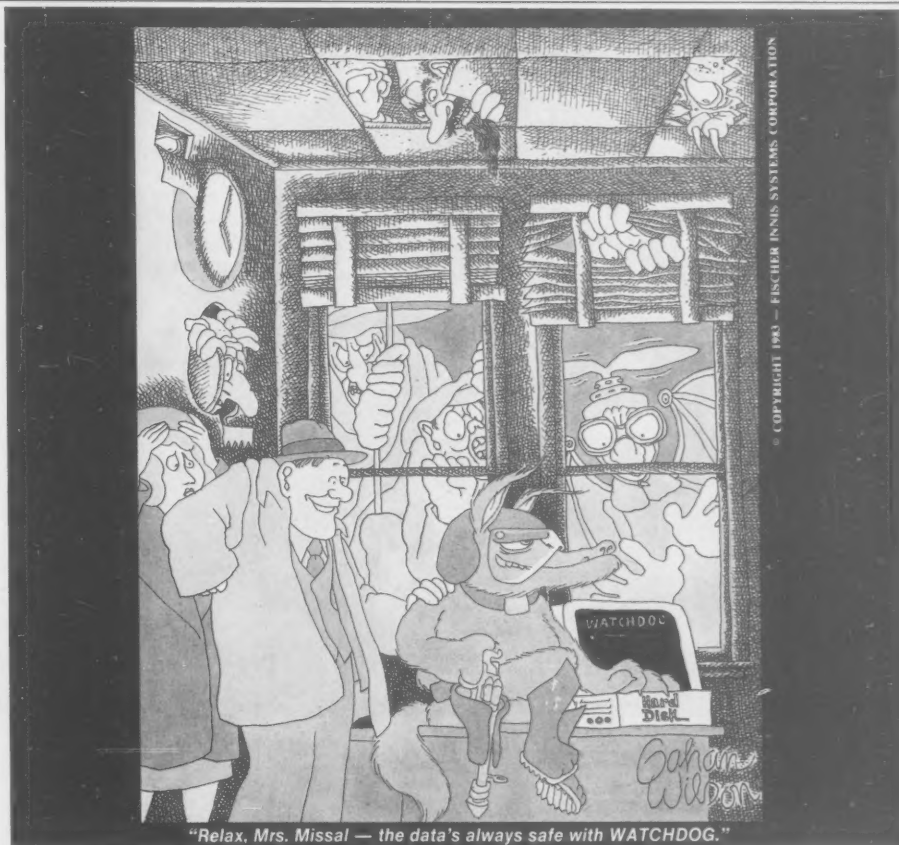
- Introduction and assumptions.
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- Transportation.
- Supplies.

A major downfall of many disaster recovery plans is the lack of a periodic review and testing of the procedures. A disaster should be simulated so that the recovery procedures can be tested, ensuring that backup facilities work in the event of a crisis. Successful operation at an alternative computer site — using remote site backup equipment, programs, files and documentation — minimizes the impact of a real disaster. Periodic testing verifies the availability of an alternative site and ensures the compatibility of software. In addition, data records, supplies and operational procedures are checked.

Disaster recovery planning is a function that many organizations will never use. However, for those who choose not to spend the time and effort developing and maintaining a plan, the potential risk is high.

As evidenced by the examples of a computer center disaster, the time of an emergency is not the time to develop an emergency plan. Once a disaster strikes, your alternatives are limited.

Savaiano is a principal in the consulting firm of Industrial Management Associates based in Manhattan Beach, Calif.



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# Physical Security Imperative to Micro Protection

(Continued from SR/18)

locking all program and data diskettes in a safe.

A common malady of many microcomputers' operating procedures is failure to back up files with optimum frequency. A rule-of-thumb gauge can be applied to give a rough approximation of such an optimum. An estimate can be made of the maximum amount of time that can be expended in recovering from a data destruction incident. That time duration becomes the backup cycle. For example, if a firm feels it can afford to spend a day recovering from a crashed disk, that firm should back

up files daily. While the restoration of the data should not take up the entire recovery period in a microcomputer system, the remaining portion of the period will probably be occupied by processing the data that arrived during restoration.

Desktop microcomputer systems in small businesses often become the "property" of one office worker. This situation is a threat to the integrity of the data in the system. Errors can be made habitually which may not be identified for long periods. Even the smallest office should have at least two operators whose duties functionally overlap. For instance, receipts

may be entered by clerk A one day, and by clerk B the next day. Clerk B would enter invoices the first day, and clerk A the next, and so on.

Access to data and programs should be as compartmentalized as possible. This can be implemented in the small business environment. Active diskette storage should not be the desktop area beside the machine. The diskettes should be secured by a specific individual. For example, the salesman might store the order entry and invoicing diskettes in his filing cabinet. The general ledger diskettes could be locked in the manager's safe.

Businesses purchasing microcomputer systems worry most about hardware failure. Yet too often, proven techniques for handling such failures are not employed. Vendors will encourage maintenance contracts and guarantee response time. "Loaner" equipment may be promised in event of failures. Whether such promises hold true is a factor of the integrity of the vendor.

But the microcomputer user can go further in protecting against such failure (sometimes at reduced expense).

## Attractive Alternative

Microcomputer systems can be configured redundantly. This can be expensive if the application requires only the installation of a single, small desktop microcomputer. But if the application calls for a central unit with several terminals, there is an attractive alternative. Networking desktop microcomputers can effectively replace a central unit. This approach to system configuration inherently mimics the fault tolerance of newer processor designs. Portions of the system may fail, but partial processing capability is assured.

The expense of redundancy can be avoided in the smallest of systems through backup-site agreements. Under such a situation, the business would identify another nearby user of the same microcomputer system. Each business would agree to maintain a similar configuration to permit mutual backup sites. Since each installation profits from such arrangements equally, it is unlikely that any expense (other than configuration changes) would be incurred.

Avoidance of a complete loss of data can be promoted by transporting backup copies of program and data to off-premise storage. For the small business, this procedure can be as simple as having the manager regularly store old file dumps in his safe at home, or in a safe-deposit box at the bank.

All of these methods can be recognized as proven techniques of computer system security which have been implemented on a small scale. Small business microcomputers can be victims of the same failures and abuses that threaten their bigger counterparts. These systems (and the organizations they support) deserve to be protected in much the same way.

Baskerville is an assistant professor of computer science at Francis Marion College in Florence, S.C.



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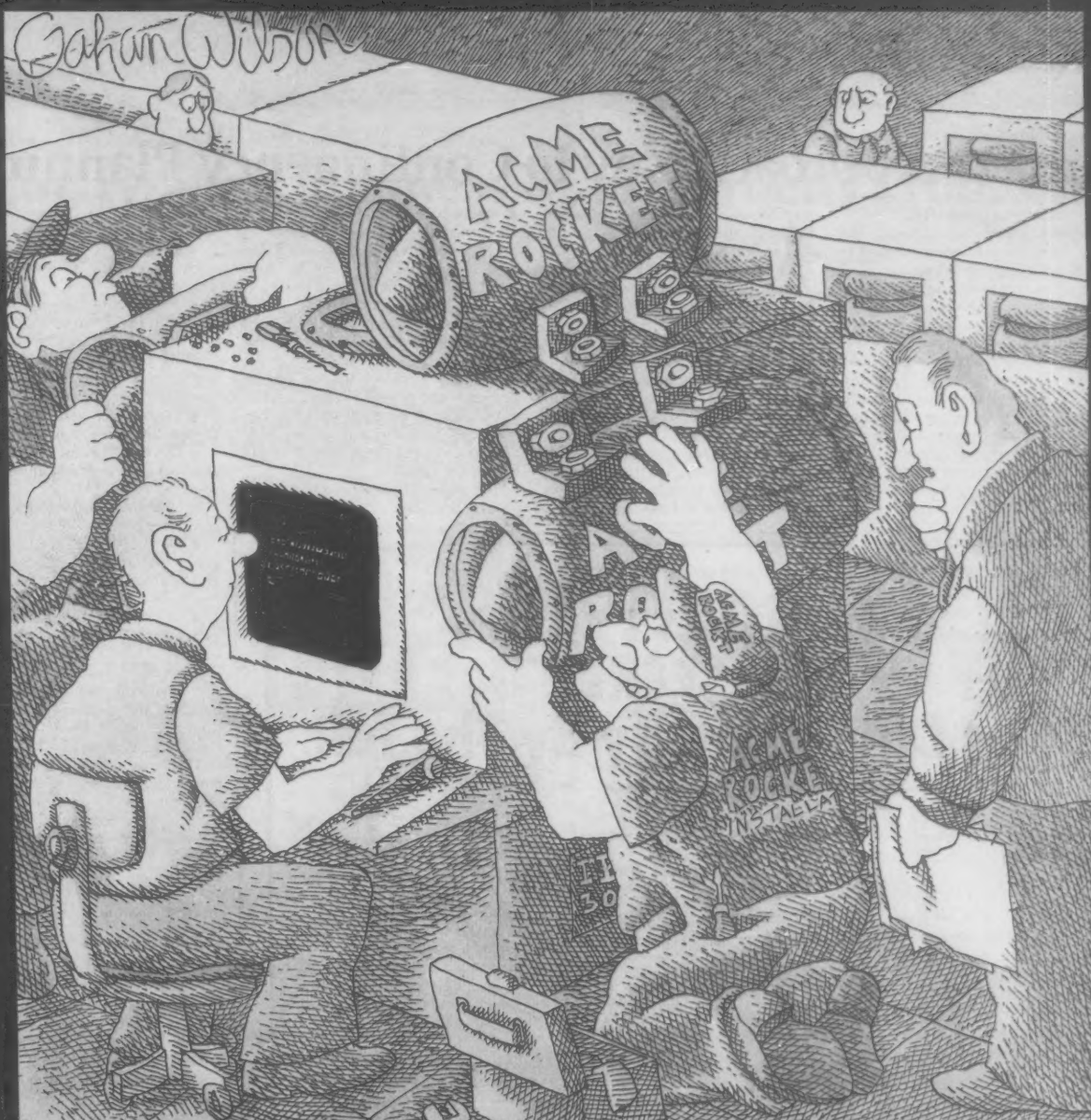


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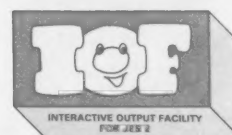
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# Project Approach Key to Contingency Planning

(Continued from SR/17)

Several years ago, Ray-O-Vac Corp. used the following method to install a contingency plan.

The first step was to develop a presentation for Ray-O-Vac's senior-level management to explain the need for such a plan and to request the executives' support. The presentation outlined the pervasive and growing nature of MIS within Ray-O-Vac and the high degree of vulnerability the organization faced without a strong effective MIS contingency plan.

The fact that a recent review of the MIS function by a group of outside consultants had strongly recom-

mended the development of a contingency plan helped gain the attention of senior management.

The presentation did not include technical jargon. There was not even the usual MIS attempt to "sell" senior management. The facts, if correctly presented, sell the need for an MIS contingency plan. The issue of contingency planning presents an opportunity for MIS to be viewed on a nontechnical basis. This may be a small issue, yet any time the MIS department can take a nontechnical approach in dealing with managers outside MIS, it is important to do so.

Once approval from senior man-

agement was obtained (a rather easy task once the issue was presented), an MIS employee was assigned specific responsibility for the development, implementation and testing of the MIS contingency plan.

A schedule was developed for the completion of the plan through the off-site testing phase. Appropriate milestones were set up for various phases of the project so that effective monitoring of progress could be carried out. The effort was, in fact, handled as any other MIS project would have been handled.

The tasks identified as a part of the process included:

- Defining the scope of the project.
- Identifying key components such as critical systems and programs.
- Prioritizing systems to be processed in the event of a disaster.
- Identifying key personnel, including outlining their specific duties in the event of a disaster and identifying each person's backup.
- Listing all vendors, with addresses and telephone numbers.
- Developing and controlling off-site backup tape (data) and form supplies.
- Selecting an off-site backup computer site.
- Developing a detailed contingency plan including documentation and testing of the plan on an ongoing basis.
- Continuing to refine the contingency plan based upon the test results.

After the development of the tasks had been completed, the process of building and implementing the contingency plan became a rather straightforward task.

This was not a full-time assignment. The idea was to devote sufficient time to the process so that the plan could be completed by a certain date, based upon a number of hours given to the subject each week. The goal was to make steady progress, not to push the plan through in the shortest possible time.

## Project Approach Assurances

The result of using a project approach in the development of the Ray-O-Vac contingency planning effort was exactly the same as with any project. Using a project approach assured the following:

- Responsibility for the project was fixed.
- Attention, as a result of clear responsibility for success, was focused on the project.
- Progress and lack of progress were monitored, and required adjustments were made.

The probability of success using a project approach is considerably higher than is the case without such an approach.

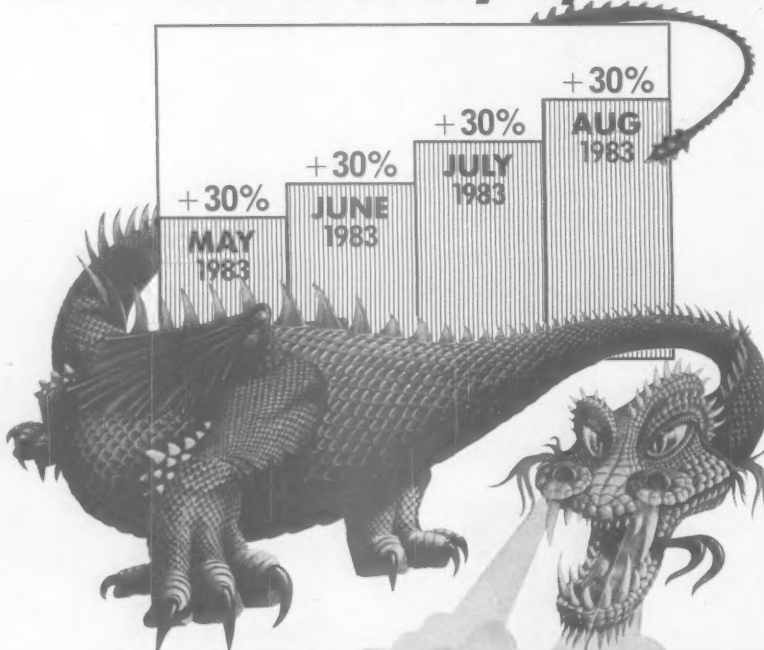
A real problem, even after a commitment has been made to install an MIS contingency plan, is the tendency to assign the process a low priority. The contingency plan is usually worked on a "time-permitting" basis. If such an approach is condoned, it will be tantamount to a guarantee that little actual progress will be made.

There will always be "more important" areas of concern within MIS. The use of a project approach will help the MIS department achieve success with its contingency plan.

Clearly, disasters do not always happen to someone else. Regardless of good intentions, contingency planning cannot be done retroactively. The time to begin the process of contingency planning is now.

Murray is director of management information services for Ray-O-Vac, Madison, Wis.

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## More Than a Technical Accessory Security Seen Business Management Problem

By Martin E. Silverman

Special to CW†

The growing dependence of business on data processing resources and the well-publicized vulnerability of those resources have forced senior management to pay attention to DP security. For those responsible for DP security, now is a golden moment; you must educate senior management and mold the results into an improved security program that will benefit us all.

DP security can no longer be "applied" just before a system is ready to go into production. Security must be planned, engineered and monitored from the design stage of systems development through application obsolescence.

DP security is not the sole responsibility of the DP director and it is not a technical problem. It is a business management problem relating to the protection of a vital corporate asset — data — as valuable as the physical means of producing one's product or the intellectual and decision-making capabilities of management itself.

Even before the recent "hacking" incidents came to light, security had been discussed with increasing frequency in publications directed at senior management. The reasons are simple: dependency on the availability of data processing resources; expenditures on these resources; the evolution of minis and microcomputers; experiments with decision support and executive support and financial modeling systems that are "user-friendly" and "require no programming knowledge."

### Need Intensified

The result is that the need for comprehensive DP security has intensified. In the microcomputer, executive-oriented arena alone, we are now distributing data for individualized "what if" analysis that used to require three signatures and four passwords to view.

This data is being left on floppy disks on unattended desks in scores of offices across the nation. Other data, entered directly by secretaries, analysts of all varieties and executives themselves, without the benefit of standards and edit procedures, is being used to generate management decisions that are accepted because they are "supported by the computer."

Clearly, DP security can no longer be considered the "technological add-on" controlled by the central DP resource. It must become an integral part of the corporate way of doing business. It must become a planning objective and a subject of concern for senior management. It is the responsibility of DP management to educate, to lead the development effort and to promulgate the results.

There are some keys to success that should be articulated in a presentation to management and some definitions of key program components that should be incorporated as objectives and areas for concern in

any developing program.

It is imperative that management understand that a DP security program is not a "one-shot deal" — it is a comprehensive program that goes far beyond obtaining a good lock for the computer room door or the development of a regular schedule for changing passwords.

If DP security is to be meaningful, it will require changes in the methodologies now used to develop systems, acquire hardware and software and plan new computer-related product offerings. It will impact, al-

though not necessarily negatively, daily operating procedures and will require the support of management at all levels if it is to be effective.

As the architect of a security program proposal, remember that few corporations will be prepared to overhaul completely their operations overnight. Any proposal must be evolutionary in nature. This will not only enable your organization to grow into its new environment, but will also enable you to sell the program in manageable pieces that do not place extraordinary demands on

the corporate budget and bottom line.

Security must be monitored by an individual who is clearly responsible for its success; it cannot be the part-time responsibility of a data processing analyst. It cannot be delegated on a rotating basis. It must be awarded in a positive sense to an individual with access to management and the planning functions of the organization, and it must have a budget.

Silverman is a principal in Coopers & Lybrand's Information Services Consulting Group in Chicago.



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# Survey: MIS Should Shoulder Security Burden

NEW YORK — Security is an issue not new to any information systems professional. In his own way, each contributes daily to the processing of data, a good amount of which is sensitive and confidential. How this data is protected both internally and externally is a matter of serious concern and utmost priority in today's business environment.

This is one of the findings of a recent survey by John J. Davis & Associates, an information management systems executive search firm based here. In addition to the security problem, the responsibility for the development of safeguards for infor-

mation systems rests with management information systems (MIS) management.

According to the survey, the majority of respondents (78%) to the question: "Who is primarily responsible for systems security?" clearly placed the solution to the problem in the hands of MIS management. Others (11%) felt that internal auditors were responsible, while only a few (less than 4%) felt the users group should shoulder the responsibility.

Most respondents were extremely protective of their hardware. Over 92% said they had security in the area of terminal access, and 97% admitted

to strict regulations regarding physical access to mainframes.

How data is protected, another key issue in the security function, was another focus of the survey. After hardware, the second most popular security area was found to be password access at the functional level.

## Security Measures in Place

Some 90% of those responding said they had password security measures in place. Password security at the data level, however, apparently is another matter. Only 65% felt the need to institute security precautions

at this point, the survey found.

As the area of communications undergoes rapid expansion, so will data base technology and usage.

Data base usage will also increase as a result of the move toward more distributed MIS environments. With this broadening of the user community, the need for more sophisticated security becomes obvious.

## UPS Seen Key To Guarding DP Investment

(Continued from SR/21)

er through the rectifier/charger and converts the power from ac to dc. The rectifier/charger also float-charges the battery that supplies additional dc power to supplement the rectifier in case of brownout or outages. The inverter then converts the supplied dc power into regulated, uninterrupted ac power and supplies it to the critical load.

Multiple UPS systems may be linked through a variety of configurations to supply either increased power for larger loads or for additional backup of the UPS. In the last several years, some manufacturers have started producing UPS systems utilizing power transistors in place of thyristors. This technology was ignored for years by conventional UPS manufacturers who were content to rely on "proven technology."

Power transistors in UPS systems permit the same miniaturization the computer industry enjoyed years ago. This new power transistor technology has resulted in smaller, lighter, quieter and more efficient UPS systems.

For the first time, the UPS can be placed on the computer room floor next to the equipment it protects. In fact, the data center manager of today may now consider the UPS a peripheral device.

Until recently, UPS systems protecting major computer installations were relegated to the basement or remote locations because of their large size and unacceptable noise level. This has changed with the introduction of the power transistorized UPS. Although detail specifications vary between manufacturers and rated sizes, the transistorized UPS is a better deal for the buyer.

Due to their enhanced converting efficiency, transistorized UPS systems have higher ac-to-ac efficiency, frequently 3% to 5% better than comparably rated thyristor models. This improved efficiency results in savings of utility costs.

Transistorized UPS units require no auxiliary circuits for commutation purposes. Power transistors have a high performance level in withstanding voltages and breakdown resistance. With fewer component parts, the new transistorized UPS is more reliable and requires less service.

Martin is president of Martin Associates, a marketing communications firm located in Plano, Texas.

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## Contingency Plan Must Be Workable

# Testing Seen Integral to Disaster Recovery Plan

By Roy A. Schwartz  
Special to CW†

The implementation of disaster recovery in the mainframe environment need not be as painful as the introduction of many previous support technologies. Past experiences with packaged software, for instance, can provide a "how to" and "how not to" guide.

A few years ago, a marketing representative for a nationally known software vendor placed more than 100 trials of his company's new system software package. The product was a report generator designed to operate on IBM and plug-compatible mainframes. The placements, which were made in less than 30 days, enjoyed favorable market timing and vendor acceptance. But most of all, the appeal of the product was in its own documentation.

On paper, the package looked great. The installation, however, revealed such significant problems that not a single licensing agreement was reached. If today we substituted a disaster contingency plan for the report generator, the results might prove far more costly than the personnel and computer-time expenses incurred with the software package.

### Numerous Unworkable Plans

Yet there are numerous unworkable contingency plans in existence. They look as attractive on paper as the report generator that motivated so many trials. What's worse, even frightening, is that most companies don't know that their plans won't work and probably won't find out until it's too late.

In developing a disaster recovery plan, the first stage is awareness. Vendors refer to this stage as the "missionary step," and for a long time it had been the most challenging. That is changing. Regulatory agencies, auditors, industry associations, natural disasters, malicious acts, terrorism, accidents and media coverage have helped persuade vendors to take appropriate actions.

It is this first stage that has stimulated the development of so many untried contingency plans. One can argue, at this point, that at least there is a plan — although it is an unproven one. Some DP executives feel any plan is better than the no-action alternative still so common throughout the industry. This logic is acceptable only if one ignores the existence of other approaches to the problem.

These other approaches may be borrowed from the packaged software experience mentioned. Just as we have learned to justify software only if merited, our first question in disaster recovery might logically be: "Is a plan called for at all?"

There are a great number of variables that separate data processing environments — even those with identical hardware configurations. Dependencies on information systems may run from minimal to absolute. Companies with multiple, similarly configured sites may have needs differing from single-site op-

erations or those with inconsistent hardware and systems. Distributed data processing, remote services, the type of industry, manual backup options, user requirements and seasonal needs are just a few of the factors that must be considered in choosing an automated service.

### Impact Determined

The actual measure or impact on the company must be determined prior to the development of a plan. Evaluations from the financial, legal and goodwill aspects are imperative.

Objective identification of essential services is also a prerequisite to recovery plans.

This predisaster recovery plan approach needs to satisfy those regulatory agencies, auditors, stockholders, directors and other interested parties asking the question: "To what extent will the company be affected in the event of an unplanned, prolonged interruption of data processing services?"

If the impact study reveals no risk to the company, no further action need be taken. However, a periodic

reevaluation of that condition should be conducted to determine whether it should be continued. If, in fact, the study discloses the existence of sufficient negative impact, then the next step should be taken.

If users identify a need for a particular software function, they either develop it or purchase it. If development appears to be extensive, involving significant time and expense, and a suitable offering is available from a vendor, it is probably better to purchase. These same software con-

(Continued on SR/28)

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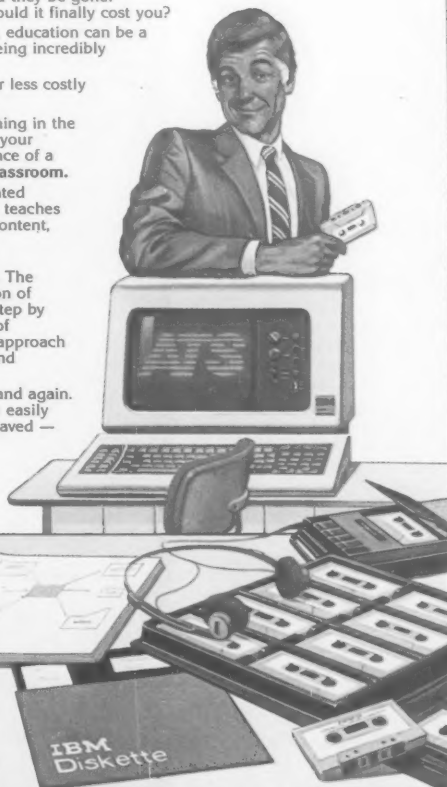
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# Disaster Contingency Plans Need Test Run

(Continued from SR/27)  
siderations may be applied to the next step of disaster recovery planning, which is the actual recovery plan.

The choice of in-house development or vendor purchase becomes easier after identifying the contents required for the actual recovery plan. They include the written plan, off-site storage, interim processing, special insurance, technical considerations, activation procedures, reconstruction and, most important, an ability to evolve so as to maintain viability despite changes in personnel and systems.

Development of the actual recovery plan is only a beginning. It needs to be tested just as the impressively documented report generator needed to be tested to determine its value. The test should be at the computer site that will be used following an actual disaster.

## Less Than Identical

Too many "identically" configured environments prove less than identical when activated with transported software. In one recent test, a company could not load its software despite what appeared to be hardware compatibility. A considerable amount of time and investigation revealed the problem was in the company's tape management system.

The package, which was licensed from a system software vendor, checked and found not only the wrong

CPU identifier, but also the wrong CPU model. While the vendor's current release eliminated the identification requirements, the company was running one release behind.

A new release was required from the distantly located vendor. This took a great deal of time and might

have proven very costly in an actual disaster. Such possibilities for error argue against a plan that does not include testing.

Packaged software is used regularly, so its value continues to be known. A good disaster recovery plan requires testing about four times each year. The testing provides

valuable experience under "battlefield conditions" and proves the continuing viability of the plan. In addition, an annual surprise review coordinated by the chief executive officer is recommended.

Costs for planning and recovery services vary depending on computer con-

figuration. "Surprisingly affordable" is a typical sentiment expressed by most companies after they obtain quotes for their own requirements.

Schwartz is currently the national sales and marketing manager for Policy Management Systems Corp.'s Disaster Control Services based in Atlanta.



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## Trade-Secrets Thefts Prompting Tighter Controls

By Liliane Choney

Special to CW†

Earlier this year, IBM took Hitachi Ltd. to court for stealing IBM trade secrets — and won. As a result of that suit, IBM launched an important policy, instituting tighter controls over its trade-secret information.

For example, IBM will no longer release trade-secret material, such as source code, in order to protect its market position. Other companies — such as those dealing with software products — will probably follow IBM's example.

But without IBM's clout,

can these companies follow in IBM's footsteps? Can they continue in business without making source code available?

The end user is becoming more risk-conscious in protecting a software investment. He wants to know that he will be able to change, up-

date or otherwise support the acquisition. He wants to know that the developer will be around to support his acquisition.

The DP industry is becoming all too familiar with the boom-and-bust syndrome: the young entrepreneur with a great idea, but little man-

agement experience; a good development team with inadequate financial resources or not enough time to test the product; and the company eager to make a quick buck and hoping to get out of the business before any maintenance problems arise.

All of this has led to bankruptcies in the industry, with the possibility of even more.

The software supplier can do what IBM is doing. It can restrict access to trade-secret materials — and still provide the user with reasonable business protection.

### Software Escrow

Through an arrangement commonly known as software escrow, the supplier can furnish the user with controlled access to trade-secret materials. This arrangement is a type of insurance policy for the user or other beneficiaries such as the publisher representing the software developer; the OEM using the software as part of its system; the software distributor or the software investor.

Escrow arrangements that are typically suggested — through banks and media vaults — have offered only limited protection.

Banks lack the physical ability to preserve sensitive computer media. Safe deposit boxes where the media are stored are at the mercy of air-conditioning systems designed to serve weekday operations only.

Magnets, a vacuum cleaner running near the vault or a jump in the humidity and temperature are just some of the normally insignificant acts that could jeopardize the data integrity.

### Vaults Inappropriate

Media vaults, while providing a secure physical environment for media storage, are designed for disaster recovery, but are inappropriate for handling the complexities of an effective escrow arrangement.

Because of these inadequacies, Data Securities Inc. (Continued on SR/30)

## THIS IS ONE FORM OF SUPERB SECURITY. OUR SOFTWARE IS ANOTHER.

Our ACF2, Access Control Facility, is innovative and non-traditional software that's become the standard of security software for MVS, VS1, and VM users.

A security software system so very good, so very sophisticated, that over 1000 leading organizations use ACF2 to protect their data.

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The reason for ACF2's success is due to its ability to protect all data by default with minimal machine or people overhead. We call this Implicit Security. And it allows you to decide exactly what is to be made available and to whom. ACF2 assures liability and responsibility reside specifically with those responsible for the data.

ACF2's transitional capability is also of important consequence. This allows easy movement from an unprotected environment to one where all the data is safe.

Of course, the reduction of overhead has also been instrumental in ACF2's success story because the system allows "access rules" to be interpreted with minimum I/O activity.

ACF2 also has real-time monitoring capability, along with detailed, comprehensive audit trails to detect instances of attempted unauthorized access, both when it occurs and after-the-fact. So you not only receive accountability, but also auditability.

For a presentation of ACF2 or further information on the Cambridge A\*\*2 family of high performance software systems, we invite you to call Shawn McLaren direct: 415/941-4558.

He'll be glad to tell you about a security software system that ensures the world remains your oyster.

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CW 11/28/83

ACF2 is developed by SKK, Inc., Rosemont, Illinois. ■■■



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# Tighter Vendor Code Control a Bane to Users

(Continued from SR/29)  
ternational, Inc. has brought together a team of specialists to analyze key criteria carefully for successful escrow arrangements.

It was determined that a specialized facility should be used which offers legal, technical, physical and administrative protection for both

parties involved in the arrangement. The facility should include:

- Appropriate use conditions. Simply saying the materials can be accessed is not sufficient. For example, a software vendor may allow a user access to materials for his own restricted use, but would not permit the materi-

als to be "sold" to others.

- Appropriate release conditions. Because of fast-changing laws concerning both software and business bankruptcy, these conditions must be expertly drafted.

- Careful identification of the type of materials that need to be deposited, as well as the frequency of the

deposits specified. Partial information can be just as useless as no information at all.

- Confirmation of the information requested. It is important to know that information is contained on the media and that that information is the material requested. A blank tape is worthless.

- Appropriate physical

storage to preserve the integrity of the data.

- Insurance underwriting to protect media and data loss.

- Closing notice. The escrow agent should not make any commitment to escrow until all agreements are established and all materials appropriately received. At that point only should a closing notice be provided to both parties.

Once the escrow account is established, it is important to make sure that updates to the accounts are:

- Completed. Frequently, after the original deposit is made, the promise to make additional deposits is overlooked or forgotten, resulting in obsolete or useless materials.

- In line with the procedures established for the original deposit (confirmation of the information requested and appropriate physical storage).

- Acknowledged through activity notices. The escrow agent should notify the beneficiary of the escrow arrangement about updates made to the account.

## Sensitive Issue

Access to the escrow account is the most sensitive issue. The escrow agent must be prepared to provide access only under the release conditions specified in the original agreement, which entails following precise administrative procedures and adhering to the legalities of the release conditions.

Because access is where the real value to the beneficiary is — and where the most exposure for the depositor lies — this responsibility must be handled by a third party who is trained to deal with such complex business arrangements.

Too often, unauthorized agents from either party attempt to access these materials or request the materials prematurely before the release conditions are met.

Choney is vice-president of Data Securities International, a La Jolla, Calif., software protection firm.

## You've come a long way, Jesse James

Jesse James 20th Century cousins are on the loose: electronic whiz kids, disgruntled employees and full-fledged criminals who are breaking codes and saying "open sesame" to dial-up data ports. They're stealing millions of dollars, confidential reports and everyone's peace of mind. They use terminals instead of guns and are not as visible as Jesse... in fact you may not be aware of them at all.

Computer security has made headlines in the Wall Street Journal and other publications and a major motion picture, "War Games," deals with the problem. LeeMAH has a "lock" for your computer even the whiz kids can't crack. The Secure Access Systems, both single port (SAU) and multi-port (SAM) units,

are microprocessor-driven hardware systems installed between the telephone network and the modem. Neither is another software coding scheme nor an encryption plan. Both SAU and SAM answer all calls, receive a location code and disconnect. If the code is valid, they find the callback number in the directory, dial that number and establish a connection via any modem.

SAM also has these features: 32-port shelf, handling 2,048 callback numbers; modular, from two ports to hundreds; audit trail; handles a multitude of facilities (WATS, MCI, Telco network, PBX exts., etc.); offers programmable routing capabilities; and programmed via any ASCII terminal.

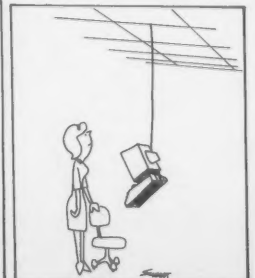
It took a \$10,000 reward to stop Jesse. LeeMAH's solution costs less than a tenth as much. Stop Jesse's cousins before your losses are too great.

Computer Security by ...

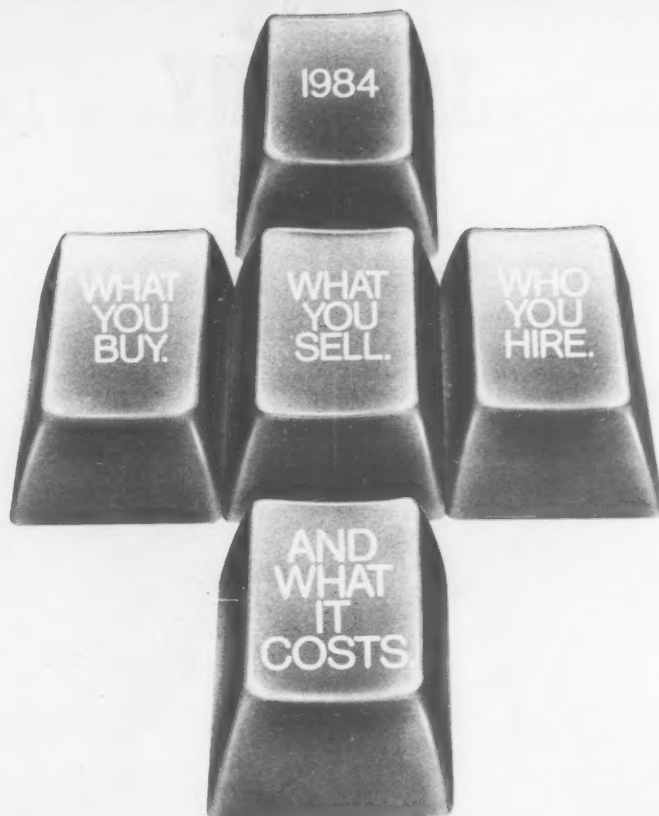


**LeeMAH**

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**What happens in the computer industry in 1984 will profoundly affect the way you do business. This January 2nd Computerworld is going to give you a very educated guess on how it will all fall out.**

Computerworld's annual review and forecast issue will examine some of the major events of 1983 and put them in perspective. But this year the stronger emphasis is on what's going to happen in 1984:

- The January 1 divestiture of AT&T. What will the impact really be?
- When is the shakeout going to come in the Micro market? Who will the big players be and who'll be dropping out?
- The results of the Computerworld DP Budget Survey: Where is the DP/MIS exec's money going to go? Why?
- Technology. Just what are the R&D people actually working on?

Last year's software announcements and/or agreements will be looked at in light of

which will come to reality in 1984. You'll get a close look at control, security and training issues and how they'll impact DP/MIS managers who spent 1983 off-loading applications to end-users and providing them with computing power.

The entire editorial staff of Computerworld is working full time to review the key events of 1983 and how they'll affect your business in 1984. So you'll get all the insight you need to do your strategic planning for the year ahead.

If you've got product or service ads that will help our readers make informed choices for 1984 — then you need to get color ads to us by December 9th and black and white ads to us by December 15th.

To reserve space in the combined December 26th/January 2nd special issue, call one of the sales offices listed below, or call Don Fagan, Vice President Sales/Marketing; Ed Marecki, National Sales Director or Kathy Doyle, Marketing Support Manager.



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## And you're going to have a terrific view...

When the industry giants clash next year, *Computerworld's* 16 years of experience in reporting on IBM and AT&T is going to make all the difference to you. The January 18th issue of *Computerworld On Communications* — entirely devoted to "IBM versus AT&T" — will give you an insider's look at the facts, the suppositions and the predictions.

### You'll read about:

- The battle over the local area networks market.
- Workstation wars: How will AT&T compete with IBM for desk space?
- The PBX conflict: Will IBM make its own or continue to get outside technology?
- What other coalitions will be formed as competition heats up for DP/MIS/Communications budgets?

**Computerworld On Communications** is going to go behind those closed doors to get you all the answers — because we're experienced at asking *your* questions. And this is just the first of six issues of *On Communications* to be published in 1984. There'll be five more — on topics like Local Area Networks, State-of-the-Art Communications Technology at the Olympics, an AT&T Update, CATV, and Voice Communications. If you're one of *Computerworld's* 122,000 subscribers,

you'll get each of these issues as a bonus with your *Computerworld* subscription.

As the marketplace for communications products opens up, new products — and new vendors — will emerge. If this is your marketplace, then you've got products our readers need to know about. You'll want them represented in this "IBM versus AT&T" issue. Just get your ad to us by December 9th.

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## To Reduce Applications Backlog Involve End Users With On-Line Systems

By Dixie Acker  
Special to CW

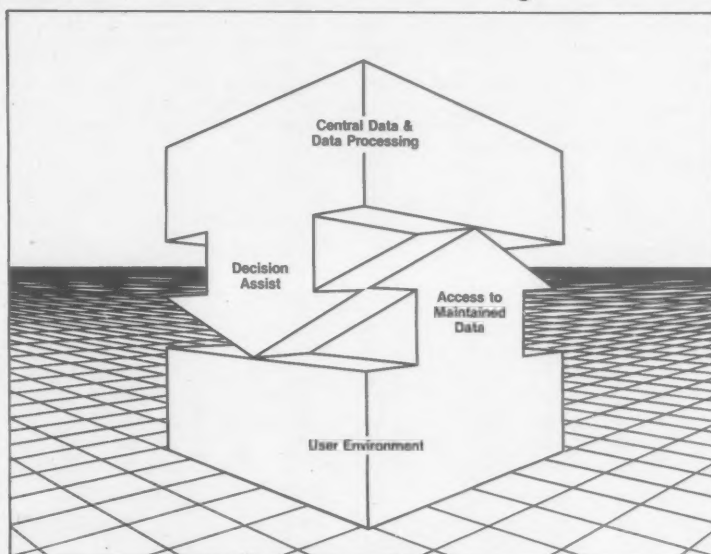
Over the years data base management systems (DBMS) have been tried and tested and have proven to be well worth their investment. But information is not always readily available for end users. If the data cannot be accessed by the decision makers, the best DBMS in the world is of little or no value.

As end-user awareness of the benefits of automated processing increases, so does the applications backlog. There simply are not enough data processing professionals to respond to all requests.

The nonrepetitive, one-time requests of the end users represent 60% of the applications backlog. Even if the backlog were significantly reduced, information changes as rapidly as the business conditions it reflects. Since it is difficult to predict changes, it is virtually impossible to anticipate and schedule the information requests.

The only answer to the growing applications backlog is to involve end users with on-line systems. Although the solution sounds simple, beware of the pitfalls. Although end users clamor for accurate,

(Continued on Page 98)



Bringing the Benefits of DBMS to the End User

## Outside Information Services Seen Key to Better Management

By Steven Sieck  
Special to CW

How do you integrate outside information tapped by modem-equipped knowledge workers with corporate management information systems (MIS)? Of the issues raised

by corporate America's ongoing occupation with personal computers, none is thornier or more immediate.

On-line, interactive information services, used intelligently, can make a crucial difference in management effectiveness. There are currently over 1,700 different data bases available on-line, according to Cuadra Associates, Inc.'s Direc-

While on-line data base services are proliferating, few companies are integrating them effectively into their total data processing environment. In this first part of a two-part series, Steven Sieck describes the opportunities provided by external data bases.

tory of On-Line Data Bases. They are offered by over 100 on-line services.

The overwhelming majority of these are accessible by standard personal computer communications. At the same time, the increasing use of such services, especially by less experienced users, presents a formidable challenge to the formulation of corporate information management strategies.

During the last decade, MIS departments were justifiably obsessed with providing corporate management information about its own operations and

(Continued on Page 103)

## Pansophic Unveils Release of 'Gener/ol' For IBM CICS Use

OAK BROOK, Ill. — Pansophic Systems, Inc. has announced a release of Gener/ol Version 3.0, an interactive on-line program development and query system designed for use under IBM's CICS.

The base Gener/ol system (formerly known as SGT) consists of a number of editor/compiler that provide the facilities to create transactions or queries under CICS.

Version 3.0 includes an array sort that may be used to sort any array of fixed-length records, a spokesman said. Up to 32,767K bytes may be passed from one program to another.

Editor/compiler edit each statement  
(Continued on Page 96)

## Three methods to access virtual storage better.

VSAM is complex, confusing and easy to misuse. Yet, data management requires effective control. Corodale's VSAM management products are the answer.

They provide a fast, accurate way to access, tune and control VSAM files. They save machine time, reduce report gleaning, provide better information.

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Bypasses IDCAMS and generates file and volume reports, each more concise and easy to read than LISTCAT output.

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## For Users of Cullinet IDMS Payroll/Personnel System Debuts

WALNUT CREEK, Calif. — Integral Systems, Inc. (ISI) has announced its on-line Payroll/Personnel System for users of Cullinet Software, Inc.'s IDMS data base management system.

The system is written entirely in Cullinet's Application Development System/Online, in conjunction with Cullinet's Integrated Data Dictionary (IDD) and IDMS,

a spokesman said. All schemata, subschemata, screens, programs and work records reside in IDD.

This provides on-line mapping capabilities and increased field-edit enhancements for screen painting and mapping. Attribute selection involves filling in the blanks of a multiple-choice question.

The Payroll/Personnel

System is a modular package. Components include personnel management, payroll, applicant tracking, position control, application-level data security, benefits and pension administration. It ranges in price from \$100,000 to \$300,000, depending on modules and options selected, from ISI at 165 Lennon Lane, Walnut Creek, Calif. 94598.

## Update of 'Business Modeler' Announced for CICS/VS

OAK BROOK, Ill. — Business Model Systems, Inc. has announced Version 2.0 of its Business Modeler financial modeling and control system for IBM's CICS/VS running under IBM's MVS operating system.

System enhancements include an electronic spreadsheet with 9,999-line by 97-col. capability on a single spreadsheet, formatted

screens with full prompting and function keys, facilities for printing at a system printer during an on-line session, printing at a cluster of attached IBM 3280-type printers during an on-line session, printing at remotely attached printers and submitting batch jobs for background execution, according to the vendor.

The price of \$20,000 includes the first year's maintenance. Business Model Systems is at 2625 W. Butterfield Road, Oak Brook, Ill. 60521.

## Lehigh Enhances Simulator

BETHLEHEM, Pa. — Lehigh University has announced the Differential Systems Simulator, Version 2 (DSS/2), containing spatial discretization routines for initial-value ordinary and partial differential equations in one, two and three dimensions, with application to elliptic, hyperbolic and parabolic partial differential equations.

According to the vendor, DSS/2 is a library of transportable, Fortran IV subroutines for the numeric integration of systems of initial-value ordinary and partial differential equations.

DSS/2 runs on most mainframes. Its Fortran IV source code is available on 9-track tape for \$1,000 from Whitaker Laboratory No. 5, Lehigh University, Bethlehem, Pa. 180215.

## Version 3.0 Of 'Gener/ol' Unveiled

(Continued from Page 95)  
as it is entered, flagging syntax errors, the spokesman said. The screen provides a detailed description of the error upon request.

There are six editor/compiler in the Gener/ol environment. Each one accepts the same commands where applicable. The language within Gener/ol is an interactive procedural language that is capable of handling scientific formulas.

Security is provided through a lock-and-key concept. A user may be automatically put into a directory or program upon sign-on.

The base price is \$25,000 for IBM DOS and \$35,000 for IBM OS. Pansophic Systems is located at 709 Enterprise Drive, Oak Brook, Ill. 60521.

# Tear out this coupon before someone rips off your CICS system.

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# Alaska. A Natural place for a Network.

## NET-WORK Distributed Data Processing System

Alaska has always been famous for its natural environment.

Now it has a Natural Network as well.

The combination of Software AG's NATURAL, NET-WORK, and ADABAS has given Alaska's statewide MIS Department the tools it needs to keep information flowing throughout the biggest state in the U.S.

NATURAL is Software AG's fourth-generation information processing system—a tool that provides the productivity needed in a place where people are the most priceless resource of all. One NATURAL programmer can typically do the work of 10 to 20 COBOL programmers.

NET-WORK is the distributed processing software that allows Alaska's officials to manipulate data from

multiple systems hundreds of miles apart—without having to worry about which location has what data.

And ADABAS is the data base management system that lets it all happen in a convenient, friendly, and relational way.

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Powerful Software Solutions

## Get End Users Involved To Make Most of DBMS

(Continued from Page 95)

timely information, they find themselves a bit reluctant to become involved with "computereze." Also, due to a perceived loss of control, there has been a reluctance on the part of DP to involve end users with on-line systems.

However, with DP freed to concentrate on issues that require its expertise, it can act as a consultant to the end users. The entire organization benefits.

IBM's Information Center represents a new philosophy in computerization and has produced the need for more user-friendly systems. This forced change in technology has put query languages, report writers, decision support programs, graphics, personal computing and word processing in the hands of end users.

### Subset of Info Center

A decision support system (DSS) can be thought of as a subset of the Information Center. A DSS used with a DBMS allows users to share information. A DSS is a wonderful tool that supports decision making and benefits data processing and end users alike. But there are considerations to be made before implementing one.

For example, each corporation should carefully weigh the pros and cons before sinking thousands of dollars into a complete DSS. An alternative might be to sign on with a time-sharing service to introduce DSS.

Staffing is another consideration. The systems support manager, who was for years the undisputed master of the company's computing power, and Cobol programmers are beginning to see themselves as endangered species.

If the DSS can be portrayed as an extension of data processing and can reduce some of the pressure, the two can coexist, and DP will welcome the reduction in the applications backlog.

Security is also a concern. Organizations recognize that with shared data it is necessary to maintain control of the mainframe data to ensure accuracy of corporate data. Control may be maintained in one of three ways: limiting access, with passwords, to only specific files; limiting certain files and data to be sent to specific terminals; or providing a data view in which security is at the file or information level.

With the high cost of phone lines for mainframe terminals, microprocessor solutions offer an attractive, low-cost solution to integrating the information needs of the business environment. Dependence on the mainframe is minimized if data is moved efficiently from the mainframe to the micro environment.

With the advent of the back-end processor, it is now possible to link micro systems to communicate not only with the mainframe but with each other as well. With a file server comes the capability for multiple users to share data in a local-area network.

Beyond the file server, the data base server extends that capability to

include data definition, data integrity and data manipulation at a logical level.

Other new decision support products support "what if" decision modeling with a two-dimensional matrix or spreadsheet. The decision support software automatically maintains interrelationships among the conditional data.

Corporate decision makers should consider passing on the benefits of a DBMS to the end user via a DSS. But in weighing the pros and cons, they should ask themselves just how much a good decision is worth.

Acker is in the Marketing Support Group at Intel Corp.

## Geisco System Manages Sales Order Information

ROCKVILLE, Md. — General Electric Information Services Co. (Geisco) has announced the Sales Order Management (SOM) system, said to process and maintain sales order information as part of the firm's Mims/MFG application system for manufacturing planning and control.

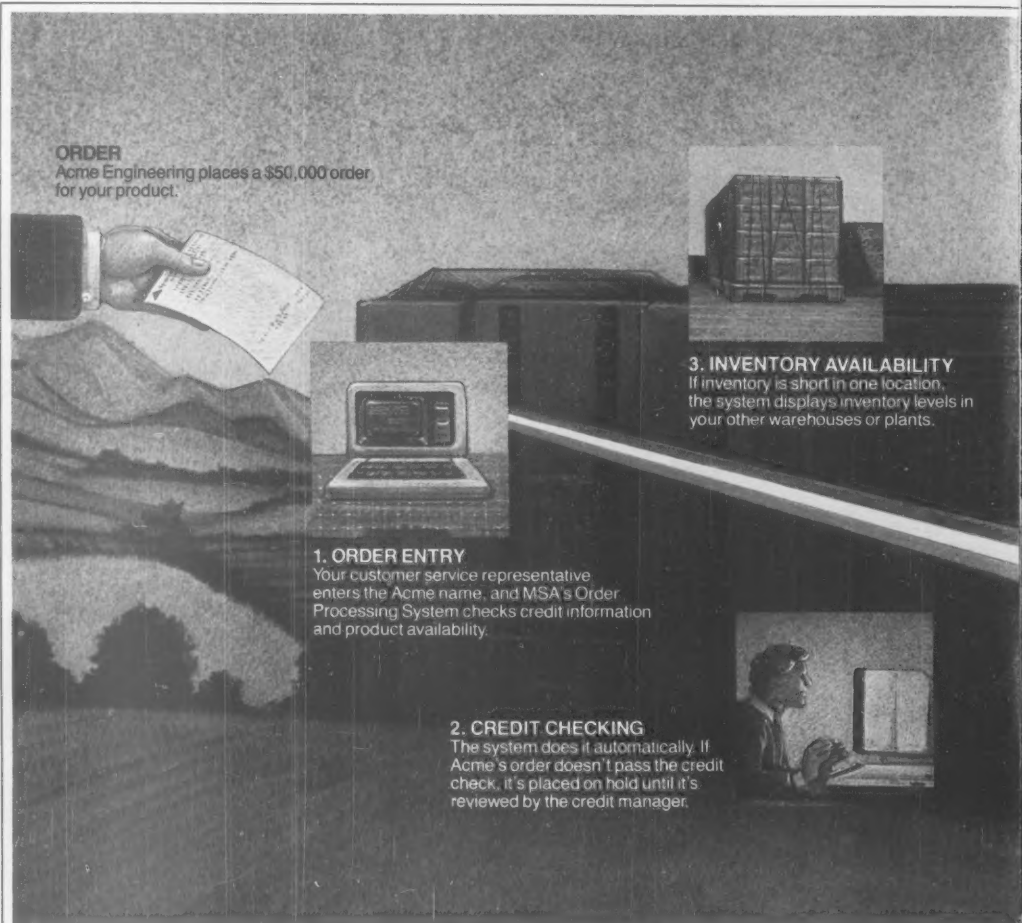
The company said that SOM will track sales orders throughout their life cycles, from initial order entry through release, shipment and closing. An automated shipment function is said to produce pick lists and record shipment information for sales order items due to be picked and delivered.

The Mims/MFG package, which

was designed for use with IBM mainframes, is based on GE's Mims, a fourth-generation, nonprocedural language and data base management system. It is a series of packages designed to enable manufacturers to plan and control manufacturing.

The Mims/MFG system also includes bill of material control, purchasing, production and inventory as well as parts control, material requirements planning, master scheduling and product costing modules.

The SOM module of the Mims/MFG package is priced at \$10,000 for both IBM VM and MVS versions from Geisco, 401 N. Washington St., Rockville, Md. 20850.



## MSA introduces the shortest distance between two points. New MSA Order Processing.

MSA's remarkable new Order Processing System keeps every order on track and on schedule.

It automatically checks credit and inventory availability. Schedules shipping. Bills customers. Immediately throws a red flag if there's a problem. Then resumes the process when the problem is resolved.

It's the perfect way to keep your customers satisfied.

Now they won't have to wait while your customer service representative keys in line after line of information. The system automatically displays addresses, preferred shipment and other order-related information.

It also instantly checks current credit records, saving your service representative that time-consuming task.

Customer inquiries are a snap with MSA's



From Adesse

## Two Subsystems Offered for IBM VM/SP Users

RIDGEFIELD, Conn. — The Adesse Corp. has announced two products for IBM VM/SP users: VM/SP Performance Analysis/Capacity Evaluation Subsystem (Pace) and Release 1.2 of the VM Terminal Simulation Subsystem (TSS).

According to the vendor, Pace was designed as a tool for system and application testing, performance analysis and prediction, capacity evaluation and stress testing.

The product executes in a virtual machine and drives an installation-defined configuration of IBM 3270 terminal devices, the vendor said.

Rental costs for the product range from \$975 to \$1,950 per month. The

purchase price range is from \$22,500 to \$45,000.

TSS is a CMS program that executes in a virtual machine and makes it look like a standard Ascii or Binary Synchronous Communications IBM 3780 terminal, the vendor said. Using an automatic calling unit or manual calling facilities, the product connects to another system, called the external system, under user control. Once a connection is established, a conversation can reportedly be conducted between the user and the external system using TSS facilities.

Three new functions eliminate the need to use CMS disk storage as an intermediate staging area for files to

be transmitted or received. Two new user exits are provided in Release 1.2 to extend an installation's ability to augment basic TSS capabilities.

The product is offered for \$110/mo or can be purchased for \$5,000. Adesse can be reached through P.O. Box 515, Ridgefield, Conn. 06877.

## DG Unveils Four Packages For Eclipse MV Superminis

WESTBORO, Mass. — Data General Corp. has introduced four software packages for its Eclipse MV superminicomputer family, all developed by third-party vendors participating in the firm's Independent Software Vendor program.

Rapport from Logica, Inc. of New York is a data base management system (DBMS) that offers a relational approach to data management. According to the vendor, it provides a means for managing large or complex data structures. Prices are \$15,000 to \$57,000, depending on modules required.

Computer Modeling System (CMS) from Computer Modeling Ltd. of Framingham, Mass., is a decision support system that allows managers to develop computer-based, menu-driven applications. Designed to run on DG's Eclipse MV/Family Systems and the new Desktop Generator Systems, CMS offers unlimited model size, formatted screens, report generation, business graphics, multi-currency hierarchical consolidation, a Help facility and an on-screen tutorial, a spokesman said. It costs \$1,750 to \$8,950, depending on hardware configuration.

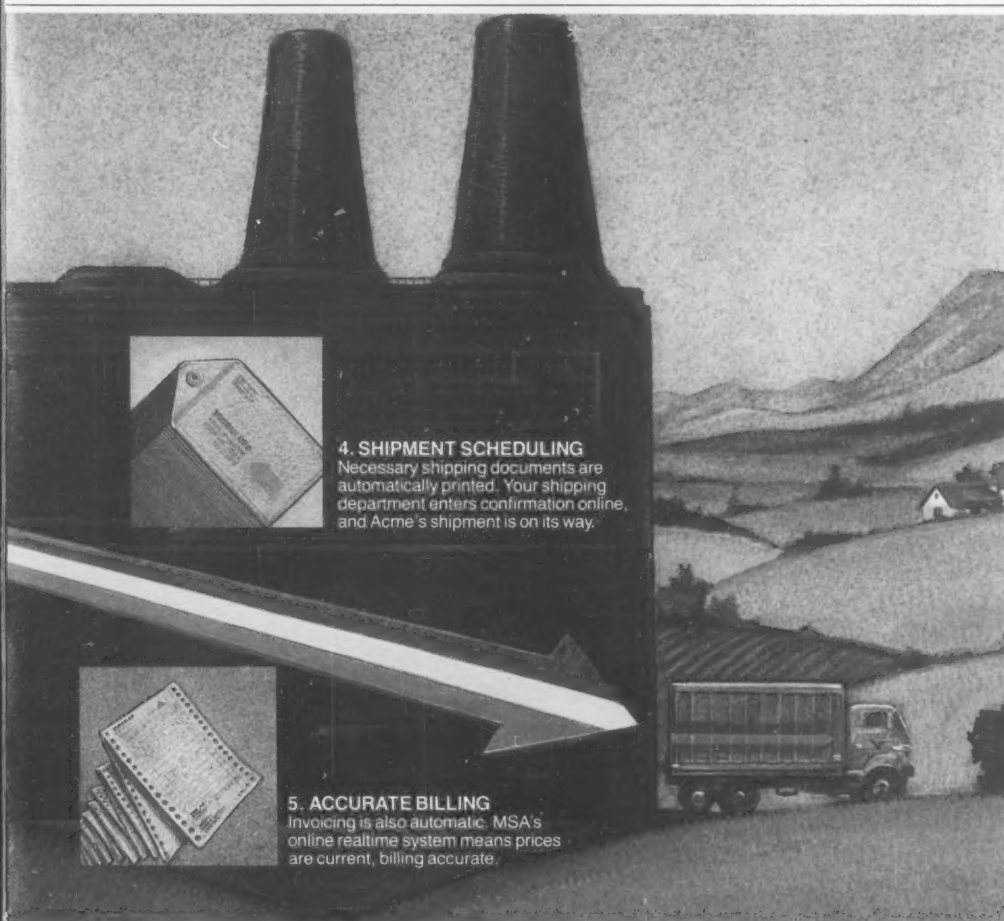
The SIR Database Software System from Scientific Information Retrieval, Inc. of Evanston, Ill., consists of:

- SIR/DBMS, a relational DBMS for business research data analysis.
- SIR/Host, a direct interface between SIR/DBMS and programs written in Fortran or some other host language.
- SIR/Forms, an integrated forms language for screen-oriented data entry that includes an interface to SIR/DBMS and major statistical packages and generates camera-ready tabular displays.
- SIR/SQL, an enhanced version of IBM's relational structured query language. The price of the SIR system ranges from \$20,000 to \$50,000.

Interactive Financial Planning System (IFPS) from Execucom Systems Corp. of Austin, Texas, is a modeling system for managers and analysts. It consists of six integrated subsystems — Executive, Modeling Language, Report Generator, Data File, Command File and Structure.

IFPS operates on all DG Eclipse MV/Family Systems under the AOS/VS operating system. It costs \$40,000 for a five-year license for the Eclipse MV/4000 or \$64,000 for a five-year license for the Eclipse MV/8000 II and MV/10000.

DG is located at 4400 Computer Drive, Westboro, Mass. 01581.



### 4. SHIPMENT SCHEDULING

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Invoicing is also automatic. MSA's online realtime system means prices are current, billing accurate.

system. It lets you review the status of orders, prices, credit or inventory availability at a moment's notice. You can change orders easily.

And the system is flexible enough to handle special requests for shipping vendors, packaging, delivery dates or special handling procedures.

Just as important, MSA's online realtime system helps you control internal costs. It moves orders along without costly error or duplication of effort. It provides current information on pricing, discounts and special sales agreements with individual customers.

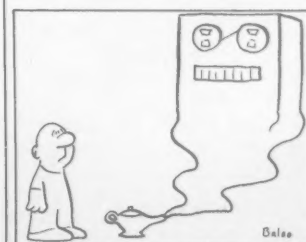
And it's a powerful tool for controlling inventory, since you can conveniently check on inventory status daily.

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flexible and easy to use. It works with the MSA Manufacturing System to let you schedule production more efficiently. And promise ship dates to customers more confidently. Of course, it's also perfectly integrated with MSA's Financial System.

If your company is ready for a dramatic improvement in your order processing, contact Robert Carpenter at (404) 239-2000. Or write Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

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## For Burroughs, IBM Users

# File Transfer Software Bows

CINCINNATI — Intercomputer Communications Corp. (ICC) has announced the Intercom 300 and 300B file transfer software packages, said to allow advanced file transfers between Burroughs Corp. mainframes and IBM Personal Computers.

The Intercom 300 is said to enable the user to customize programs to meet specific system needs by transferring files between the IBM Personal Computer and a Burroughs mainframe and allowing batch file

transfers to be initiated by either machine.

Application programs written on the Personal Computer can reportedly communicate with those on the Burroughs machine, and an automatic message routine is said to allow the user to specify sequences of messages.

Intercom 300B, available in three individual programs, is supplied as source code and provided on magnetic tape for the Burroughs mainframe.

The 300 is priced at \$250, and the 300B costs \$500 for the source code. More information is available from ICC at 3195 Linwood Ave., Cincinnati, Ohio 45208.

## SPSS Announces Enhancement To 'SPSS-X TM'

CHICAGO — SPSS, Inc. has announced Release 2.0 of the SPSS-X TM Information Analysis System, which is said to ease the transportation of files across machine types with what the vendor labeled an Import/Export facility.

Designed for use with IBM's CMS, MVS and Digital Equipment Corp.'s VAX/VMS operating systems, SPSS-X TM reportedly facilitates the transport of data and dictionary information across machine types to allow end users to share access to information held in portable data files.

The vendor said, for example, that users at an IBM installation of SPSS-X can use the Import command to read a portable file created with the Export command at a DEC VAX-11 site. The vendor defined portable files as character files holding all of an SPSS-X system file, including the data dictionary with variable and value labels, missing value flags and printing and writing formats for each variable.

In addition, the package will translate characters from the portable file to match the character set in use at the receiving installation, reducing translation time, according to the spokesman for the vendor.

Release 2.0 of the SPSS-X TM package has an initial license fee of \$4,000 from SPSS, 444 N. Michigan Ave., Chicago, Ill. 60611.

## Forms Management System Debuts for DEC VAX-11s

BURLINGTON, Mass. — Interactive Systems, Inc. has announced a release of its Scope forms management system for use with Digital Equipment Corp.'s VAX-11 superminicomputers.

The release, labeled DEC-10/20, incorporates an improved user interface, more flexible programmer calls and improved functionality of the Scope forms editor, according to the vendor. The package reportedly will handle multiple forms per screen and the underlining or boxing of fields. Intra-field editing has been added to enable users to change selected

characters in a field without altering the remainder of the data.

The version is also said to offer the ability to create a table of values for the validation of entered data. It provides a recently developed cut-and-paste capability allowing for the creation and modification of forms. Programs written with the new version of Scope can be run in batch mode with no modification.

DEC-10/20 will be available in the first quarter of 1984 for a license fee of \$8,500 from Interactive Systems, 131 Middlesex Tnpk., Burlington, Mass. 01803.



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## Portable Software Targets Computerized Manufacturing

CUPERTINO, Calif. — Enhansys, Inc. has introduced a portable software system that incorporates components for computerized manufacturing problem solving, including data access, analysis and presentation.

The system is aimed primarily at analytical professionals who use computerized equipment on the factory floor. The access and processing functions of the system are based on natural-language requests and require no knowledge of the underlying computer system, a spokesman claimed. The user interface offers natural-language control over mathematics and statistics processing, inquiry and reporting and graphics. It also supports electronic mail, word processing, planning and scheduling.

The system's transparent file access recalls data by common names, regardless of location. Its portability to different computer systems enables the user to work with one language.

System costs vary according to machine size, with a maximum of \$5,250/mo from Enhansys at Suite 100, 20111 Stevens Creek Blvd., Cupertino, Calif. 95014.

## Second Release of 'Unalter' Features Conversion Report

NEWTON, Mass. — Software Tools has announced the second release of its Unalter software package, which the vendor described as a language conversion processor for use in DOS and OS operating system environments.

Unalter is reportedly designed to reprocess Cobol programs using the Alter verb as the first step in the process of upgrading Cobol programs to Cobol 80 standards. The second version is said to feature a conversion report designed for maintenance documentation, which flags all program modifications made by Unalter. The vendor said the document can be included in the source code to enhance further program modification control, documentation and maintenance.

The Unalter system is priced at \$750 from Software Tools through P.O. Box 191, Newton, Mass. 02168.

## Spreadsheet Announced For System/36

SILVER SPRING, Md. — The Computer Marketing Division of Professionals Unlimited has announced the Executive Interactive Computational Algorithm (Exical/36) spreadsheet package for the IBM System/36 small business computer.

Exical/36 reportedly enables the user to define separately a model, the data entry for the model, the processing of the model and the reporting of the results. It is said to feature color display graphics through the IBM Model 5292 workstation and a Help function.

Exical/36 spreadsheet package is priced at \$2,500 for a perpetual license, according to a vendor spokesman. More information is available from Professionals Unlimited, 3951 Lantern Drive, Silver Spring, Md. 20902.

## Accounting Tool Gets Unix

GLENDALE, Calif. — Theta Business Systems, Inc. has announced a Unix version of its accounting software.

Scheduled for release on Jan. 1, 1984 are Unix versions of Theta's accounts receivable and payable, general ledger, order entry with inventory control, billing and sales analysis, payroll and Pascal development system modules. According to the vendor, the modules are fully integrated, and each can also be used as a stand-alone package, with the exception of the order entry system which requires the accounts receivable module.

Source code for each module is priced at \$1,250, and object code is priced at \$750 per module from Theta Business Systems, Suite 106, 1110 Sonora Ave., Glendale, Calif. 91201.

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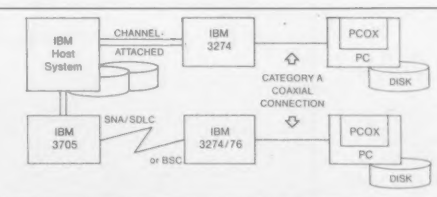
FUNCTION/FEATURE*	CXI Availability	IBM Availability
3278/79 Models Supported		
3278 Model 2	NOW	1st Qtr 1984
3278 Models 3 and 4	NOW	Not Available
3279 Model 2A (base color mode)	NOW	1st Qtr 1984
3279 Model 3A (base color mode)	NOW	Not Available
3279 Model 4A (base color mode)	NOW	Not Available
NOTE: IBM does not produce a 3279 Model 4A (3440-character screen)		
Controller Connections Supported		
3276 Display/Controller	NOW	Not Available
3274 Controller	NOW	1st Qtr 1984
3274 Port D (for 3274 customization)	NOW	Not Available
Display Characteristics		
1920-character monochrome	NOW	1st Qtr 1984
1920-character color	NOW	1st Qtr 1984
Printer Support		
Screen Print to 3274-attached Printer	NOW	1st Qtr 1984
Screen Print to 3276-attached Printer	NOW	Not Available
Screen Print to PC-attached Printer	NOW	1st Qtr 1984
Screen Save to PC Disk File	NOW	Not Available
Operator Information Area (status line)	NOW	1st Qtr 1984
Concurrent Operation		
PC DOS Session	NOW	1st Qtr 1984
DOS 2.0 Print Spooling	NOW	Not Available
Keyboards		
Special 3270 PC Keyboard	Not Available	1st Qtr 1984
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Hardware Diagnostic and Dump Facility	NOW	1st Qtr 1984
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SPF (System Productivity Facility) in Local Mode	DEC. 1983	Not Available
NOTE: With PCOX/m3278/SPF, which CXI is jointly marketing with Phaser Systems, Inc., of San Francisco		

\*This table compares a PCOX-equipped IBM or IBM-compatible personal computer running the PCOX/Control Unit Terminal Program with an IBM 3270-PC running the 3270-PC Control Program (in the Control Unit Terminal Mode).

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## For Both Batch and On-Line

# IMS Programmers Get Nonprocedural Cobol

WAITSFIELD, Vt. — Three programming products from Computing Productivity, Inc. are said to give IBM IMS programmers nonprocedural Cobol for both batch and on-line data base referencing and for IMS/DC and CICS/VS terminal referencing.

Version 2.0 of IP3-DB adds nonprocedural data referencing verbs to Cobol that conform to Cobol syntax and semantic format, a spokesman said. This makes the Cobol application program independent of both Vsam and IMS access methods, data base architecture and status return codes.

Version 1.0 of IP3-DC and IP3-

CICS provide nonprocedural Receive and Send verbs that conform to Cobol syntax and semantic format. The terminal referencing provided by these verbs is said to make the program independent of the IMS/DC architecture and CICS/VS command-level terminal referencing.

All three products eliminate the need for training in IMS/DC and CICS/VS programming and related debugging, the company said.

IP3-DB verbs operate in both batch and on-line programs and are portable across IMS and/or Vsam files. IP3-DB nonprocedural statements may be mixed into the same program with IMS and Vsam calls so

that IP3-DB can be used for maintenance of the current Cobol program inventory, the spokesman claimed.

IP3-DC and IP3-CICS are completely integrated with IP3-DB. Nonprocedural data referencing to Vsam files and IMS data bases is achieved through IP3-DB statements in the

on-line program.

IP3-DB is available on permanent license for a fee of \$35,000. IP3-DC and IP3-CICS are each available for a license fee of \$12,000.

Computing Productivity can be reached at Larrow House, Waitsfield, Vt. 05674.

## POS Data Capture System Provides Retail Reporting

CUPERTINO, Calif. — Tymshare, Inc. has announced a new electronic point-of-sale (POS) data capture sys-

tem that reportedly provides draft capture, headquarters reconciliation and comprehensive reporting to retailers and financial institutions.

According to the vendor, the point-of-sale data capture system is delivered by dial-up terminals through the company's Tymnet data communications network, which provides local access in more than 450 cities and 40 countries.

The system is said to feature the ability to handle different types of transactions electronically, including sales, credits, voids and post authorizations in addition to detailed transaction reports for banks or for merchants' corporate headquarters. The transaction reports show daily store-level activity. The system also provides for the transmission of depositary tapes to the merchant's bank or processor.

According to the vendor, the point-of-sale service costs between 16 and 19 cents per transaction, depending on whether the terminal provided is bought or leased from Tymshare, located at 20705 Valley Green Drive, Cupertino, Calif. 95014.

## Sales Manager Offers Support For HP 3000

CANOGA PARK, Calif. — A sales management information system for users of Hewlett-Packard Co. HP 3000 minicomputers was recently announced by Business Systems Associates, Inc.

The SMS/3000 reportedly includes sales information management features such as territory assignment and control, immediate lead identification and tracking, lead source analysis, client purchase patterns and profiles, sales cycle scheduling, sales progress monitoring, computerized customer file and mailing list management. A spokesman said the package enables the monitoring of sales progress by individual, by district or region and by entire sales area.

The package also includes electronic mail capability and a word processing and correspondence generation interface, the spokesman said. It is written in Cobol 11 and uses HP's Image data base management system and View/3000 screen forms.

The package is available immediately at a price of \$15,000 from Business Systems Associates, 20942 Osborne St., Canoga Park, Calif. 91304.

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 CW COMMUNICATIONS, INC.

# Integrating Outside Information Seen Key

(Continued from Page 95)

performance. In the same 10 years, the number of user terminals accessing remote commercial data bases has zoomed from fewer than 50,000 to over 450,000, representing more than 600,000 passwords and subscriptions.

Partly as a result, many MIS directors found themselves in a not-so-peaceful coexistence with a then-flourishing remote computer services industry. Time-sharing's traditional appeal — that it could be used to provide end users with applications otherwise mired in in-house backlogs — is the same as the appeal of the personal computer.

Both have furnished end users with strategies to close the gap between what end users wanted and what MIS was able to provide. And while applications previously supplied by on-line computer service companies are being taken over by personal computers, the combination of the two presents a new generation of opportunities to multiply white-collar productivity.

## Trends Behind Increase

There are several underlying trends behind the increase in terminals:

- Increasing awareness of the need for better access to external information.
- The ongoing coordination of data from various financial and other markets and the creation of new markets that exist only on electronic services.
- The falling costs of terminals, the gradual acceptance of public data networks and the dropping underlying costs of computers, storage media and transmission are making the electronic delivery of more information products feasible.

In 1982, the electronic information industry passed \$1 billion in value. Link Resources Corp. research indicates that this market will continue to grow at an overall rate of about 23% — reaching over \$2.9 billion by 1987.

Every company needs to formalize its approach to integrating MIS and external information. If internal and external information is not brought

into a coordinated setting, the corporation runs the risk of failing to use its full information resources.

On a more practical level, an overall strategy is needed to minimize the costs of outside services. A lack of planning can result in excessive costs. These are due to inefficient use by untrained users where in-house specialists or outside information brokers could perform the same function more cost-effectively. The excessive costs are also due to redundancy of on-line information requests and payments and to lack of information about the services available.

Tying every personal computer user into a central corporate data base will clearly increase the power

and responsibility of MIS directors with regard to the use of outside information services. Unfortunately, this area is unfamiliar territory for many of them.

In putting together this strategy, one must recognize that the special needs of various constituencies within a company are very different. In most sizable organizations, there are three main types of on-line services users: professional and specialized, including lawyers, economists and investors; librarians; and casual, occasional users like managers and executives.

Many professionals have been using on-line data base services for many years and have adopted routine attitudes toward them. A recent

Link study of over 1,000 end users of data base services found that 51% had been working with information supplied by on-line services for five years or longer. Forty-six percent had one to five people reporting to them, with another 26% responsible for managing six or more employees. One of the most striking findings about this group of users is that the personal computer has made relatively little penetration into their working environments. Only 27% said they had personal computers available in their departments, while 51% cited the availability of dumb terminals.

Sieck directs the Electronic Information Program at Link Resources in New York.

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COMMUNICATION NETWORKS '84, will take place at the Washington Convention Center in Washington, D.C., the telecomm capitol. It will be held on January 31 - February 2, 1984.

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The DEC Rainbow 100+ The Rainbow 100+ system unit features 280A and 6808 microprocessors, a 10 MB Winchester hard disk, a dual floppy diskette with 800 KB capacity and synchronous communications, built-in terminal emulator, printer port and 128 KB of system memory.

## Accounting Aid For Series/1 Announced

TAMPA, Fla. — Consolidated Management Systems, Inc. has announced the Management Information Control System (Mics) accounting package for users of IBM's Series/1 computer system.

The management system consists of the following software applications: security system, accounts payable, accounts receivable, payroll, budget entry and control, general ledger and property control and depreciation, according to the vendor.

The product is written in Emulation Design Language and IBM Cobol utilizing the Indexed Access Method file structure. It costs \$9,300 from Consolidated Management Systems through P.O. Box 290382, Tampa, Fla. 33687.



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## Astco Targets MVS, VS1 With Release 2.1 of 'Astute'

PALO ALTO, Calif. — Astco has announced Release 2.1 of Astute, a data set and catalog management system for IBM's MVS and VS1 operating systems which is said to enhance support for IBM Vsam data sets.

Astute's selection mechanism may be used to select any attribute of a Vsam object. Its reporting facility may be used to report this information, optionally sorted in ascending or descending order. This may be combined with Astute's preprocessing facility to produce a complete Vsam data set management system.

Also available in the new release are IBM MVS/XA support, a disk-to-disk copy facility and a redefine fa-

cility that generates define commands for any specified Vsam object.

Astute costs \$7,000 on the first CPU. Astco is located at 926 Amarillo Ave., Palo Alto, Calif. 94303.

## Design System Out for IBM Micro

STILLWATER, Minn. — Phoenix Performance Systems, Inc. has announced a computer-aided instruction computer courseware design system for use with the IBM Personal Computer.

Dubbed The Author Plus, the system reportedly enables the courseware generator to create on-line, interactive computer lessons on

any topic. An enhanced version of the company's The Author system, it features extended use of function keys, learner option for page-back to previous frame, expanded graphics capabilities and full-screen text and graphics entry and editing.

The package is priced at \$295 from Phoenix Performance Systems, 324 S. Main St., Stillwater, Minn. 55082.

Systems Network Architecture (SNA) data communications networks.

The product offers end-to-end host/network capacity management, a spokesman said. It includes the ability to project the effects of increases or changes in work load on networks and their components; determine when performance will fall below standards; determine possible solutions for projected service problems; identify the causes and solutions for service bottlenecks; "tune" the network; calculate the consequences of network expansion on performance; and perform "what-if" functions for factors affecting network performance.

Best/1-SNA includes an automatic interface to BGS' Best/1-MVS or Best/1-VM capacity management packages for IBM mainframe operating systems. A user deciding whether to add terminals at remote locations can use Best/1-SNA to determine what the response time would be at the new terminals, what impact their addition would have on response time throughout the network and what adjustments would be required to meet response-time standards.

The package views all components of a network as well as their interrelationships, the spokesman said. It incorporates full screen, menu-driven operation based on IBM's System Productivity Facility, default values and on-line tutorial facilities. It generates a variety of standard reports.

Best/1-SNA has a base price of \$22,500 per network site from BGS at One University Office Park, Waltham, Mass. 02254.

## Graphics Tool Made to Fit IBM 5080 Series

BOULDER, Colo. — Precision Visuals, Inc. has announced that its DI-3000 graphics tools package will run on the IBM 5080 Graphics System.

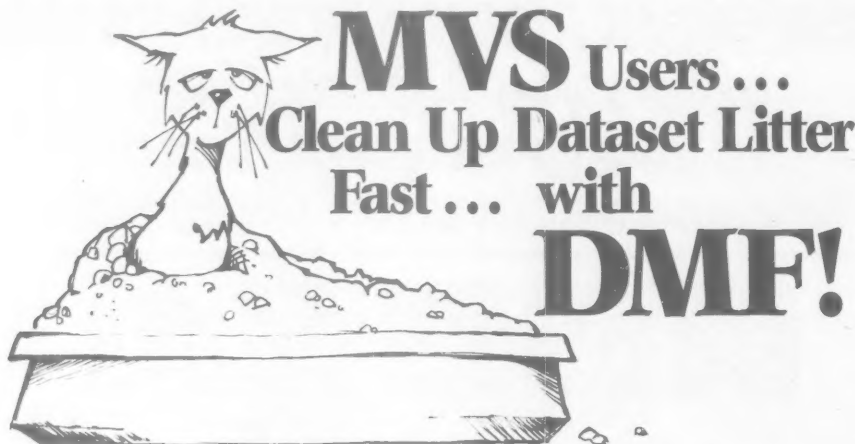
DI-3000 can be used in engineering, scientific and computer-assisted design applications, a spokesman said. Capabilities include two- and three-dimension dynamic image transformation, complex polygon fill with colors or patterns, hardware picking and color table access.

The full complement of IBM 5080 input devices are supported, including a graphics table, lighted function key pad andvaluator dials.

Written in Fortran, DI-3000 is an integrated system of 200 user-callable subroutines. It supports a variety of graphics terminals and hard-copy devices, allowing existing applications written under DI-3000 to be transported to the 5080.

Prices for a 25-year DI-3000 license on IBM processors are \$12,000 for the 4300 series, \$15,000 for the 3030 series and \$19,000 for the 3080 series.

More information is available from Precision Visuals, which is located at 6260 Lookout Road, Boulder, Colo. 80301.



Are your whiskers in a twist about dataset litter? Not mine! Not since my Data Center Manager got me DMF!

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- **Full screen display** of dataset information from the system catalog or from on-line volumes, complete with six-way scrolling
- **Extensive dataset selection criteria**, including use of "wild cards", prefix and suffix matching
- **Extensive interactive "help" and tutorial** capability
- **Single character line commands** for dataset manipulation such as edit, browse, delete, rename, catalog, etc.
- **Maintenance of running totals** of on-line space allocated and used
- **Extensive reporting capabilities** in batch and TSO line-oriented environments
- **Erasure of secure information** before dataset deletion.

DMF does more than clean up. Ever tried to locate a dataset when you can't remember the name? DMF finds it fast with a few keystrokes. It makes using TSO quicker and easier for just about everybody.

Tests show that DMF will do your dataset housekeeping in only 35% of the normal connect time, eliminate over 80% of your keystrokes, and save up to 50% of your CPU time! It means that your DMF will pay for itself in only a few weeks of regular use. What purrformance!

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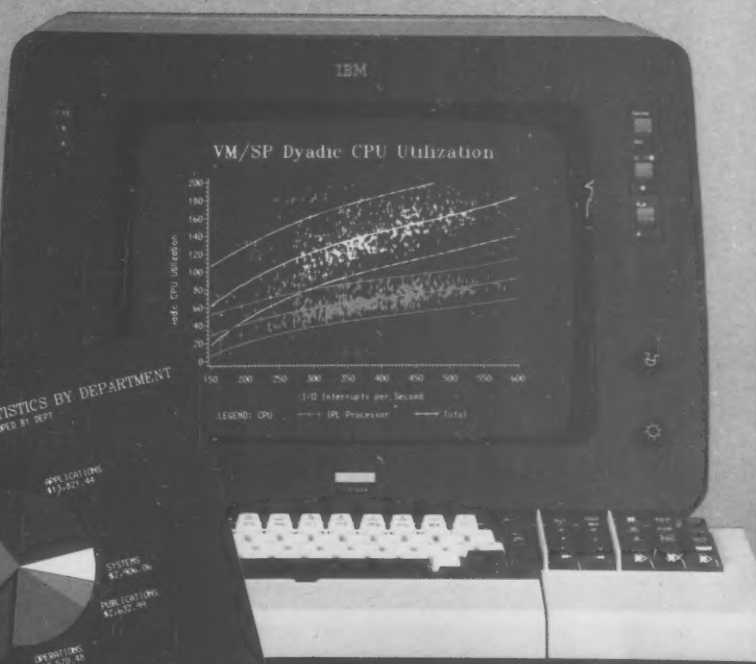


# SAS....

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DSERV	DSERV	1	2.88	2.88	311	311
	RESTORY3	1	0.72	0.72	1499	1499
DTSANALS	ICCFICS	9	110.44	12.27	34596	3844
DTSINIT	ICCFICS	4	364.80	91.20	52773	13193
DTSUTIL	ZAPTOV5	9	4.49	0.50	3227	358
LNKEDT	LETSFSTR	3	4.15	1.38	1479	493
	LINKDSR	2	0.88	0.44	708	354
	LINKFBR	1	2.30	2.30	650	650
	LINKMTR	6	10.76	1.79	7072	1179
DBJMAINT	DRZAP5	1	0.36	0.36	403	403
PDZAP	DRZAP	1	0.60	0.60	674	674
PLIOPT	BRANES	1	5.16	5.16	9157	9157
	WATR1X10	5	52.92	10.58	40674	8135
POWERJA	POWER/V5	4	226.12	56.53		
RESTORE	RESTORY3	1	2.38			
	SASLOAD	1	0.28			
RSERV	LETSFSTR	4	6.23			
	LINKFBR	1	4.53			
SARVCE	ACCTEST1	3	20.35			
	ACCTEST2	4	91.44			
	ACCTEST3	1	13.81			
	ACCTEST4	4	73.36			



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## Micro Notes

The Basic Answer (TBA), a text processing utility designed to allow the programmer to construct Basic code in a structured manner, has been released by Logical Systems, Inc. TBA runs on the Radio Shack TRS-80 Models I, III, 4 or Lobo Systems' MAX-80. TBA Version 5.1 costs \$69 and Version 6.x costs \$79 from 8970 N. 55th St., P.O. Box 23956, Milwaukee, Wis. 53223.

The Answer in Computers has released **Security, Security-Plus and Security-Plus-Log**. Se-

curity provides password protection for all programs, with no modification to the operating system, for \$50. Security-Plus, at \$100, allows the additional option of password protection for individual files. Security-Plus-Log maintains a complete record of program and file activities and retails for \$150. A demonstration disk is available at \$25. The disk may be returned and credited toward the purchase of any package to Suite 7, 6035 University Ave., San Diego, Calif. 92115.

Walonick Associates, Inc. has released **Statpac**, a microcomputer data manager and statistical analysis package geared toward the professional research community. Features include write subfile, sort cases, descriptive statistics, cross-tabs and chi-square, correlation and regression, t-tests, analysis of variance and multiple variable response. Statpac can use data files that have been downloaded from mainframes or other microcomputer programs. In addition, Statpac files are readable by any

word processor, although the package contains its own word processor-based file editor. It is available for the IBM Personal Computer XT, Victor Business Products, Inc. Victor 9000 and Radio Shack TRS-80 Models III and 4 for \$400 from 5624 Girard Ave. S., Minneapolis, Minn. 55419.

Courseware, Inc. has introduced the **Apple Authoring System**, the first in a series of software authoring packages for personal computers, which al-

lows teachers and business educators who lack programming skills to create interactive, self-paced computer-based lessons. It is designed for the Apple II and IIe personal computers and is available for \$255 from 10075 Carroll Canyon Road, San Diego, Calif. 92131.

Lifetree Software, Inc. has announced the addition of **Volkswriter Deluxe** to its Volkswriter line of office automation software for the IBM Personal Computer and Personal Computer-compatibles. Volkswriter Deluxe includes a text-merge feature, which uses Volkswriter's files to maintain mailing lists, create label sets and create personalized form letters. Volkswriter is compatible with spreadsheets such as Lotus Development Corp.'s Lotus 1-2-3 and works with data base managers such as Ashton-Tate's Dbase II. It retails for \$285 from Suite 315, 411 Pacific St., Monterey, Calif. 93940.

Radio Shack has released **Videotex Plus**, a communications package for disk system Radio Shack TRS-80 Models I, II, 4 and 12 computers. Offered for \$49.95 at Radio Shack Computer Centers and participating Radio Shack stores and dealers, both the Model I/III Videotex Plus package and the Model II, 12/16 Videotex Plus package allow communication with any computer information service such as CompuServe, Inc.'s CompuServe and Dow Jones & Co.'s News/Retrieval.

Minicomputer Modeling, Inc. has announced that **Data Model**, a menu-driven system for financial modeling and spreadsheet management is now available for IBM-, Wang Laboratories, Inc.- and Microsoft, Inc. MS-DOS-compatible computers. Data Model's "Virtual Spreadsheet" design allows an unlimited number of individual spreadsheets to each contain 500 col. and 30,000 rows. "Multidirectional Consolidation" capability permits any number of consolidations to be performed in any direction. Permanent licenses, which include enhancements and updates for one year, are \$1295. More information is available from Suite B, 1507 Queen Anne Ave. N., Seattle, Wash. 98109.

Software Automation, Inc. has introduced **Salvo**, a fourth-generation language for the personal computer. Salvo combines a relational data base management system and a natural language interpreter, allowing users to give English commands to the computer, to retrieve and/or manipulate data and to develop applications without detailed programming. Salvo retails for \$495. Information is available from 14333 Proton Road, Dallas, Texas 75234.

**Idris**, a Unix-like operating system from Whitesmith Ltd. is now available for Digital Equipment Corp.'s Professional 350 computer. It will be sold under a joint marketing agreement with DEC. Idris alone costs \$550; it can be purchased with a C compiler for \$1100 and with C and Pascal compilers for \$1250 from 97 Lowell Road, Concord, Mass. 01742.

(Continued on Page 108)

## KEY TRONIC Refines The Televideo-925\* Keyboard



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# Sperry Updates OS/3 for System 80, 90 Users

BLUE BELL, Pa. — Sperry Corp. has announced Release 8.1 of its OS/3 operating system, which features enhancements to the Data Base Management (DMS) system for Sperry System 80, 90/30 and 90/40 users.

Also, Sperry announced enhancements to the Escort language system, including a new report system that is said to allow users to create, display and manipulate files as tabular reports. The system also features the capability to display multiple records

of a file on a single screen without multiple transmissions, according to a spokesman.

Sperry said the Escort system, designed for use in the OS/3 environment, enables users to perform data entry, transaction processing, reports, queries and computation with English language commands. The enhanced version is said to offer improved enter, update and change commands, and the capability to access uncataloged files.

The OS/3 operating system now reportedly features improved file access performance for data utilities, sorts, IBM's IMS and user-written programs compiled under Release 8.0 of RPG-III, Cobol and Fortran. In addition, the package offers an accel-

erated load directory search function, which has enhanced the resident loader to use an indexed search algorithm when searching the directory load library.

In addition, the operating system is said to include a new resident shared code loader, which Sperry claims will improve the performance of any product that uses shared code by reducing the number of inputs and outputs required to load a shared code module. A data management file sharing feature reportedly permits users to access a specified file in the read and write modes without restriction.

The DMS data base management system for the OS/3 environment has been enhanced to include start-

up control of optional features, a new error message when invalid pointers are detected, additional pre-processor validation, space inventory page processing, recovery file allocation and cancel and swap error trapping. The improvements to OS/3 are available to System 80 Model 4 and Model 6 users immediately and will be available to Model 8 users with the expected introduction of Release 8.2 in the first quarter of 1984.

The Escort software for the System 80 Models 4 and 6 can be leased for \$79 monthly, and the DMS data base management system for the System 80 Models 4 and 6 is available for \$233 monthly from Sperry, Computer Systems, P.O. Box 500, Blue Bell, Pa. 19424.

## Utility Allows Report Printing On CICS Printer

MINNEAPOLIS — Davis, Thomas and Associates, Inc. recently announced a software utility for printing reports on IBM CICS/VS network printers, reportedly eliminating the need for IBM Power/RJE telephone lines and equipment.

DTAprint runs as a task under CICS and provides the capability to print or view reports that reside in the Power/VSE list queue on the CICS/VS IBM 3270 terminals or 3280 series printers attached to the network, according to a spokesman for the vendor.

The package reportedly can restrict access by terminal to selected Power queue classes and will optionally log which reports have been printed by which terminals. It allows users to print specific pages of a report, rather than the entire report, the spokesman said.

The package utilizes standard IBM DOS/VSE and Power/VSE options and can be leased for \$120 per month or purchased for \$2,400 from Davis, Thomas and Associates, Suite 301, 8800 Highway 7, Minneapolis, Minn. 55426.

## Payroll Service From Bradford Out for Micros

TEANECK, N.J. — Bradford National Computer Services, an affiliate of Bradford National Corp., has announced its Payroll/Human Resources service, which the vendor said can be accessed through most current microcomputers.

The service is said to allow subscribers to utilize 500 earnings and 500 deduction categories for each employee, 200 user-defined fields, 94 standard reports, a variety of specialized reports and an on-line adjustment transaction feature that enables one entry to adjust an entire payroll.

The vendor said all tax jurisdictions are incorporated into the system along with a standard range of banking services that are available to customers. The system also generates employee benefit statements and historical information.

The Payroll/Human Resources service may be accessed 24 hours a day at a cost of \$3/connect-hour from Bradford National Computer Services, 1500 Palisade Ave., Teaneck, N.J. 07666.

## A Match Made To Win... Introducing Thoroughbred™ Software on the IBM PC/XT

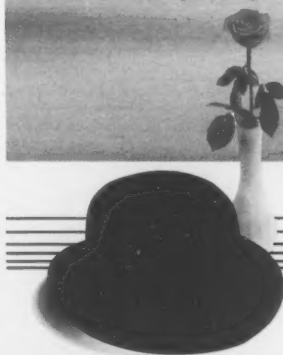


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## Micro Notes

(Continued from Page 106)

Structured Software Group, Inc. (SSG) has reduced the prices of its **financial and productivity software packages** up to 50%. Prices now range from \$100 to \$595. Previously, the packages were priced from \$200 to \$1200. Included in the price reductions are general ledger, accounts receivable, accounts payable, Magic Worksheet, Word Right and Qsort. SSG is also offering the Magic Worksheet package free with the purchase of any two other SSG packages.

Lion Micro Systems has announced the **CP/M Recovery** program, which is said to eliminate data and text memory loss due to systems crashes, program errors, disk failures and other causes. CP/M Recovery reportedly allows the user to recover memory, conduct editing on data within memory (including control characters) and save the data in any disk file.

CP/M Recovery runs on Digital Research, Inc.'s CP/M operating system and is available from Suite 122, 2 Dallas Communications Complex, Irving, Texas 75039.

Tymshare, Inc. has introduced **PC/Focus**, a data base management system designed to run on the IBM Personal Computer, which uses non-procedural English sentences instead of conventional programming. It is identical to Tymshare's mainframe Focus in design, function and capabilities. PC/Focus is available from 20705 Valley Green Drive, Cupertino, Calif. 95014.

**OZ: Management Control**, a software package that integrates data analysis, graphics and reports, has been announced by Fox & Geller, Inc. OZ has a built-in variance analysis system that can pinpoint and explain budget variances

and is the only program for micros that offers this capability, according to a company spokesman. A version for the IBM Personal Computer will be available in January 1984 for approximately \$500, and versions for other personal computers will follow. Information is available from 604 Market St., Elmwood Park, N.J. 07407.

Marc Software International, Inc. has announced **Muse Word Processing**, a word processing package for the Eagle Computer, Inc. personal computer and Eagle 1600 series, which offers a scientific typing feature with 13 levels of superscripts and subscripts. Special character sets provide Greek and math characters. Muse also features a spelling checker, mailing list processing, advanced document selection capability and document recovery system. Muse sells for \$595 for a single copy, with discounts of up to 70%

for multiple copies from Suite 200, 260 Sheridan Ave., Palo Alto, Calif. 94306.

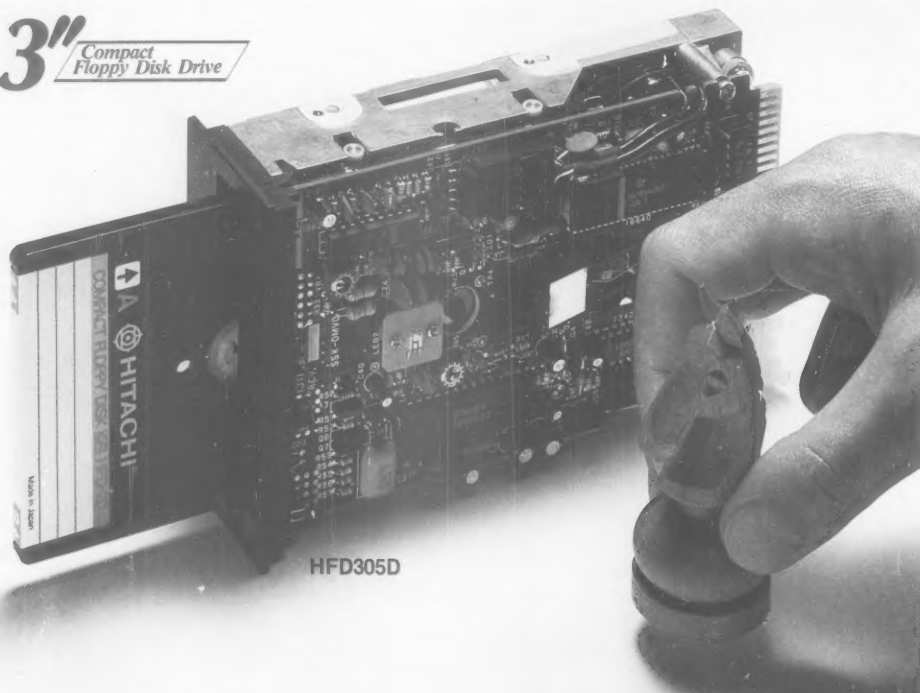
**Imaginator 2** enhancement system for the Heath/Zenith H-29 and Z-29 series of computers has been released by Cleveland Codonics, Inc. The Imaginator 2 features a 500,000 pixel/sec vector-drawing rate to illuminate its 672- by 500-pixel display. Dual on-board processors eliminate any graphics load on the computer. The memory may be arranged in horizontal, vertical or rectangular formats. The package, including installation and operating instructions, costs \$895 from the vendor at 18001 Englewood, Cleveland, Ohio 44130.

The Software Systems Division of Science Management Corp. has announced the availability of its multiuser operating system, **Thoroughbred/OS**, for the IBM Personal Computer XT. Thoroughbred/OS supports the full line of Thoroughbred software and comes with a Business Basic that contains all the arithmetic functions needed for running business applications. It retails at \$795, with discounts to distributors and retailers. Further information can be obtained from the vendor at 1011 Rt. 2, P.O. Box 6800, Bridgewater, N.J. 08807.

Professional Software, Inc. has introduced **Wordplus-PC**, featuring the Built-in On-Line Spelling System (Boss), a spelling checking program that features a 90,000-word electronic dictionary, with space for an additional 10,000 words provided by the user. During document editing, the Boss automatically locates and highlights any misspelled word and provides up to eight suggestions for correct spelling. Wordplus-PC is currently being shipped for the IBM Personal Computer to computer dealers, with versions for the Texas Instruments, Inc. Professional Computer, the Digital Equipment Corp. Rainbow and the Victor Business Products, Inc. Victor 9000 to follow. Professional Software is located at 51 Fremont St., Needham, Mass. 02194.

A series of documents describing the Unix V operating system is available from Western Electric Corp. Included are: product-release documentation, which lists the major features of Unix System V, order No. 3010909, for \$20; transitional aids, which are a collection of documents needed to move from System III to Unix System V, No. 301-908, for \$10; The Users Manual, No. 301-095, for \$35; The Administrators Manual, which supplements the Users Manual, No. 301-906, for \$15; and the Error Message Manual, available only to licensees and intended for operators and administrators, No. 301-907. Copies of the documents are available from IDC Commercial Sales, Western Electric through P.O. Box 26205, Indianapolis, Ind. 46226.

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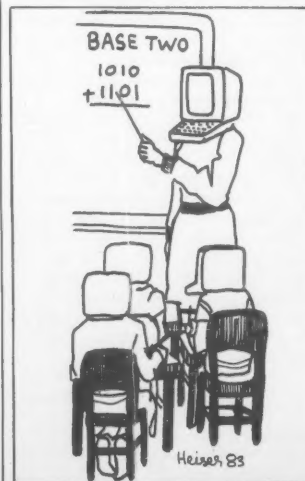
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## 'Emu' Allows IBM Micro To Copy Dasher

COLUMBIA, Md. — Rhintek, Inc. has introduced a software package said to allow the IBM Personal Computer to emulate Data General Corp.'s Dasher terminals. Called Emu, the package will also operate on the IBM Personal Computer XT and many of the IBM-compatible personal computers.

Consisting of assembly language software that bypasses the disk operating system, the package is capable of achieving a 9.6K bit/sec terminal-emulation rate. Competitive systems that are written in compiled Basic or use the DOS or Bios calls are reportedly limited to continuous rates of 2.4K bit/sec or less.

Although the package was designed for direct-connect applications, it can be used in remote and dial-up systems. The ability to perform file transfers at 9.6K bit/sec is included in the basic package.

Emu is able to transfer data to and from any PC-DOS file, even onto a different disk and through a complicated subdirectory structure, according to a vendor spokesman. The software is distributed on a non-copy-protected diskette to allow the user to move the package to a fixed disk and make backup copies for his own protection and archival purposes, a vendor spokesman said.

The license to use the software on one machine is \$95. The first 200 orders to be received will be filled at an introductory price of \$75.

The source code is available to those who need to make their own custom modifications.

More information is available from Rhintek through P.O. Box 220, Columbia, Md. 21045.

## EFT Control Top Priority In Finance

By Bill Picton and  
Will Greene  
Special to CW

Adequate control of the electronic funds transfer (EFT) function is a top priority for financial institutions, particularly if a newly developed, automated system is involved. Having the proper answers to basic questions can mean the difference between a well-controlled system and a multimillion dollar exposure.

A security-and-control review can minimize risks and answer many of the following questions:

- Can messages be lost, duplicated or illegally entered?
- What protection is there against changed, corrupted or incorrectly delivered messages?
- Can delayed, accelerated or undelivered messages be prevented or detected?
- How can messages be protected from illegal monitoring?
- Are there appropriate controls over availability of funds, kiting, repatriation of funds, foreign exchange variances, compensation liability and privacy violation?

### Security-and-Control Review

Financial institutions routinely process and transfer sensitive data and funds through widely distributed data communications networks. Substantial resources

(Continued on Page 114)

## Customized Telemiser Selects Low-Cost Routing

ONTARIO, Calif. — Communique Telecommunications, Inc. has introduced a stand-alone, real-time computer system for automatic calculation and selection of lowest cost routing of telephone calls. No private branch exchange (PBX) or Touch-Tone telephones are needed. The Telemiser is a custom-programmed, micro-processor-based system that can be added to a PBX or key station unit telephone system to select the lowest cost line available at the time of the call.

Routing is based on software calculations of the call's destination, the time of day, the time of week and the user's contract with AT&T and other long-distance carriers such as GTE Sprint and MCI Communications Corp. Calculations also include the amount of cumulative line service usage to date in each billing period to take advantage of rate breaks where applicable, a vendor spokesman said.

Since it converts rotary telephone pulse signals into tone signals, the system allows the use of long-distance companies such as MCI and Sprint (which require tone signals) with rotary telephones. It will also add any access codes necessary to use the alternate phone companies.

The Telemiser functions between the user's telephone and the PBX or key station unit telephone system and is said to be compatible with any telephone system as long as the local telephone company has already installed a standard RJ21X block.

Based on software-driven computer control of digitized voice transmission, the system supports a maximum configura-



Custom-Programmed Telemiser

tion of 500 lines. To make a call, the user dials 10 digits, which are intercepted by the least cost router. The system performs the least cost routing and places the call.

Also offered is an optional capability to monitor telephone usage and prepare management reports on utilization by connecting a video terminal or printer to the system, the spokesman said.

On-line diagnostics and video warnings are provided to alert users to problems on particular lines or trunks so corrective action may be taken. The system also maintains a data base of this information so management reports can be prepared for evaluation of existing utilization of lines, trunks and service mixes.

If a power failure occurs at the customer site, the Telemiser connects the trunk lines in a bypass mode so calls can continue to be made. An independent battery backup reportedly maintains clock timer information during power interruption.

The minimum three-line by three-line configuration is priced at \$25,000, not including software. "The software for a system of this size is estimated to cost from \$3,000 to \$5,000 because it is very site dependent," according to company president Michael T. Finnin. "Its cost depends on how many services users have and what kind of configurations need to be prepared for them."

The system is available in a vertically or horizontally configured 54- by 19-in. housing. More information is available from Communique Telecommunications, 4015 Guasti Road, Ontario, Calif. 91761.

## Data-Sat Receiver Supports Data Networks

MOUNTAIN VIEW, Calif. — Modulation Associates has introduced a satellite receiver for corporate data nets.

The Data-Sat reportedly allows reception of high-volume, point-to-multipoint 56K bit/sec data information. As a stand-alone receiver, data capability can reportedly be added to a user's already existing earth terminal.

An optional demultiplexer is also said to be available for electronic mail, reservations or network control capabilities. Priced at \$3,800, the receiver is available from Modulation Associates at 897 Independence Ave., Mountain View, Calif. 94043.

## AT&T Announces Four Modems

MORRISTOWN, N.J. — AT&T Information Systems has announced four modems for sending and receiving data over telephone lines.

The Dataphone Direct/Acoustically Coupled Modems can reportedly transmit data through a telephone handset or through direct coupling to a telephone base unit.

The products include two modems designed for use with the AT&T PDE-200 Portable Data Entry Terminal to facilitate transmission of inventory data, meter readings or other data collected to centralized data bases.

Both types are said to communicate in full-duplex mode at 300 bit/sec and are compatible with AT&T's Dataphone 103 modem.

The general-purpose Dataphone modems are said to interface through a standard RS-232C connector to virtually any home or office computer or terminal. They also reportedly open communications with public data banks and time-sharing computer systems.

Priced from \$165 to \$210, the modems are available from AT&T Information Systems through 100 Southgate Pkwy., Box 1955, Morristown, N.J. 07960.

COMMUNICATIONS

# System Guards Against Computer Intrusions

RESTON, Va. — Analytics Communications Systems, Inc. has introduced a security system designed to guard against computer intrusions.

The Sherlock Information Security System protects computer systems and networks from intrusion. It provides positive message authentication and encryption for dial-up, dedicated and multidrop systems of private and public data in existing

networks.

Sherlock requires no change in existing hardware,

## Terminal Unit Compatible With IBM 3274

RALEIGH, N.C. — CTI Data Corp. has introduced an IBM 3274-61C-compatible terminal control unit said to provide full functional capability with the IBM unit.

The CTI 3000/3 is said to feature IBM's protocol Bina-

ry Synchronous Communications and Systems Network Architecture/Synchronous Data Link Control communication capability to the host. Transmission speed on the unit is 9,600K bit/sec, with a separate port for dial-

intrusion and theft even by computer and wiretapping techniques and to provide a

up diagnostics.

The CTI 3000/3 reportedly supports standard IBM Category A terminals, including the IBM 3178.

The unit is priced at \$5,000 from CTI, 5275 North Blvd., Raleigh, N.C. 27604.

positive audit trail of authentication to individual users.

The Sherlock integrated system is priced at \$1,995 from Analytics Communications Systems, 1820 Michael Faraday Drive, Reston, Va. 22090.

## Tool Offers Registers, Data Update

ANAHEIM, Calif. — Preston Scientific, Inc. has introduced a digital-to-analog conversion system for multi-channel data systems, featuring 12-bit resolution, dual-rank input registers and 500-kHz data update.

The LCDAC12 Digital-to-Analog Conversion System is said to be specifically designed to interface with control logic available in most data acquisition and control systems. The system is said to be capable of direct installation in a range of data acquisition and control systems.

The principal application for the system is said to be in the function generator system for simulation or model testing and structural analysis. A dual-rank storage system is said to permit the random transfer of digital input data to a first-rank storage register for subsequent transfer to the digital-to-analog output.

A typical 64-channel system is priced at \$14,900, with six-week delivery. More information is available from Preston Scientific at 805 E. Cerritos Ave., Anaheim, Calif. 92806.

## System Connects To IBM Disk

LAKE ELMO, Minn. — C.D. Systems has introduced a communications system from the Azurdata, Inc. Scorepak hand-held terminal to an IBM disk.

Called the C.D. Systems Communicator, the system features a Racal-Vadic, Inc. 1250 modem operating at speeds of 1,200 bit/sec, and RPG programs, which process all data keyed or bar-coded on the Scorepak into fixed-length fields and records. The system was designed for use on an IBM 5251 or 5291 CRT. According to the vendor, no additional communications features or new device allocations are necessary.

The system is priced at \$3,275 from C.D. Systems at 8270 Hidden Bay Trail, Lake Elmo, Minn. 55042.

## Finally, micro-to-mainframe communication that's:

 <p><b>Complete</b> With 3270 and 2780/3780 using the full Bsync protocol.</p>	 <p><b>Programmable</b> Interface custom applications to the host.</p>	 <p><b>Configurable</b> Modify the protocol to your specific needs.</p>
 <p><b>Upgradable</b> Works with most microcomputers.</p>	 <p><b>Hardworking</b> Relieves all micro overhead and overload.</p>	 <p><b>Experienced</b> Emulation software proven over 6 years of customer use.</p>
 <p><b>Friendly</b> Complete, clear documentation.</p>	 <p><b>Durable</b> Engineered for reliable service.</p>	 <p><b>Affordable</b> The best part of all.</p>

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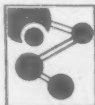
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## Software Sales

## Asset-LIAB

Execucom (IFPS) is number 1 in sales (Source: ICP Inc., \$50 M  
is number 1 in customer and Data D

## IBM Micro Given System For Transaction Monitoring

CHICAGO — Automation Design, Inc. has introduced an on-line transaction monitoring system located at the terminal site, where work session scripts are said to be executed locally.

Mort is for use on an IBM Personal Computer, connecting to the host as an IBM 3278 terminal, according to a vendor spokesman. The tool is said to work independently of any system application, application software or line protocol.

Mort is said to report "think time," data entry time, response time, elapsed time, key count and number of transactions monitored. These items are then said to be reported by total, minimum, maximum

and average.

Priced at \$2,495, Mort is available from Automation Design, at Suite 650, 350 N. Clark, Chicago, Ill. 60610.

## Package Targets Retail Industry

EBENSBURG, Pa. — Kimbro Data, Inc. has introduced an interactive communications package for the retail industry, said to poll Data Terminal Systems, Inc. electronic cash registers either through modems or directly.

DTS/Comm is composed of three sections: the Handler, to perform IBM's Binary Synchronous Communications protocol; the Driver, to

## Two-Way Communications Offered for IBM Micro

SAN JOSE, Calif. — Vynet Corp. has introduced the V1000 series, a family of system-level products said to allow multiple users to engage in

remote two-way communication with an IBM Personal Computer through a push-button telephone.

The V1000 provides up to eight channels that can be configured under software control for either voice or data. It is reportedly a fully integrated voice/response solution to the problem of communicating with a computer without terminals or modems, the vendor said.

The V1000 allows users to call or be called by the computer and to receive information in a spoken form from a program or data base. Users can respond with Touch-Tone signals to computer queries for modifying the program flow and updating the data base, the vendor said.

Users requiring data communications applications can choose among a 300 bit/sec Bell 103-compatible or a 1,200 bit/sec Bell 202-compatible modem, GPIB (IEEE 488) support or IBM 3270 support.

The base price for an 8-channel V1000 is \$7,315 in single quantities. Operating system software options are \$1,500, with licensing arrangements for quantity purchasers. Vynet is located at 160B Albright Way, Los Gatos, Calif. 95050.

## Why Do MIS Directors and Users Love Their New Davox Terminals?



### MIS Directors Love Us For Our Compatibility.

All Davox models combine true 3270 emulation (Bisync and SNA/SDLC) with ANSI-compatible Async and screen printing.

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Directory, or from a large directory maintained on a host computer—ideal for telemarketing applications.

### And Everyone Loves Us For Our IBM\* Personal Computer Attachability.

Davox terminals are the first designed to connect directly to any IBM Personal Computer, providing instant access to off-the-shelf PC programs.

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Davox Communications Corp.

\*IBM is a registered trademark of International Business Machines Corp.

## Security System Supports CICS For OS, DOS

NEW YORK — On-Line Software International has announced the Guardian 1.3 on-line CICS security system support of CICS Release 1.6.

The product is available for IBM mainframes and compatible computers and supports CICS for both OS and DOS systems. The security system offers automatic protection for transactions, programs, files, terminals and DL/I and IDMS data base management systems, the vendor said.

One of the product's enhancements permits restriction of activity on the basis of transaction contents without the need for application program changes. Another enhancement offers protection of Vsam files and data bases from unauthorized access on the basis of actual file contents, according to the vendor.

The price for computer use of the product is \$20,000 for DOS and \$27,500 for OS. Further information is available from On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.



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## Adequate Control of EFT Top Financial Priority

(Continued from Page 109)

are being expended on systems to facilitate this transfer activity, and dramatic increases are expected.

In order to assess effectively the security exposures of these critical systems, a program can be implemented to examine and evaluate the technical and operational security in funds and data transfer systems according to established message processing and application-specific risk criteria; identify and document existing, missing and inadequate controls; test the system to ensure that controls perform as intended; and document conclusions and recommendations in a formal report to management.

The basic concern is loss of funds through intentional or accidental means.

The objective of a review of EFT is to evaluate the risk of funds loss through assessment of specific controls over loss or duplication of transactions, compromise of transaction integrity, inaccurate reporting, delayed or accelerated message delivery, system failure and recovery and adequacy of audit trails.

Security reviews should be mandated according to the risk associated with the system. A system that electronically records monetary activity and/or disburses cash is a prime candidate for review. These systems include:

- International funds transfer systems.
- Domestic funds transfer systems.
- Branch teller systems.
- Automated teller machine systems.
- Credit card systems.
- Point-of-sale networks.

A controls review will provide comprehensive documentation of the functional system flow and controls by an objective third party; identification of any major design weaknesses to facilitate corrective action prior to or following system implementation; and identification of significant data processing control alternatives.

This will lead to implementation of a security review methodology that can be continued and updated by internal staff and independent, authoritative assessment of the system controls as a basis for insurance qualification.

### Security-and-Control Review

The review audit develops an in-depth understanding of the system, documents the system through a series of general and specific functional flowcharts of key system components, determines boundary controls associated with the transfer or transformation of data into or out of a system or from one functional component to another within a system and determines process control associated with the integrity and computational accuracy of data within a given functional system component.

Once the system controls have been documented, a matrix-based risk analysis is performed to evaluate control adequacy. This will identify existing, missing and inadequate

controls; analyze and test selected controls; and develop conclusions and recommendations.

Performing a security-and-control review will not guarantee that funds cannot be lost, but it will serve to identify the potential risks in a system and provide the recommendations to enhance controls in an EFT environment.

Picton and Greene are management consultants in Peat, Marwick, Mitchell & Co.'s San Francisco office. Picton, a senior manager, specializes in security and DP audit issues. Greene, a manager, focuses on data communications systems. Both have performed security reviews at several major financial institutions.

## Programmable Net Controller Added to Terminal Line

SKANEATELES FALLS, N.Y. — Welch Allyn, Inc.'s Industrial Products Division has added a programmable network controller to its terminal line said to handle up to 31 stations.

The HBD-NC is configured for RS-422 multidrop and handles and combines data between terminals and a host computer via full- or half-duplex communication. The controller is also compatible with the firm's line of bar code readers, a spokesman said. The HBD-NC controller can be configured from any on-line remote decoder or terminal by simply scanning a custom bar code menu.

The data rate between the controller and satellites is 19.2K bit/sec; the rate between the controller and host computer is selectable from 300 bit/sec to 9.6K bit/sec.

Individual terminals can be located up to 4,000 ft from the controller and addressed with their respective identification numbers.

The controller communicates with satellite stations via RS-422 multidrop and to the host computer via RS-232C or RS-422.

Welch Allyn is located at Jordan Road, Skaneateles Falls, N.Y. 13153.



## Striving for Cost Reductions

# Comm-Pro Interface Ties X.25, SNA

REDONDO BEACH, Calif. — Comm-Pro Associates has announced an interface for its X.25 network access software and IBM's Systems Network Architecture (SNA).

The Ship21 package reportedly provides a bridge for coupling X.25 and SNA networks. According to the vendor, this means that an installation can take advantage of the cost-effectiveness of X.25 communications facilities and still use the IBM SNA program products, including CICS/Vtm and TSO/Vtm.

The 3270 device does not have to be dedicated to a particular host application or a particular host at all, according to the vendor. The termi-

nal operator has the option of selecting the host and the host system with which he wishes to communicate, the vendor said.

A typical cost for the system is \$800/mo, which includes a base

price of \$500 with an additional \$100 charge for the emulator program and \$200 for NCP.

The vendor is located at Suite A2, 121 Torrance Blvd., Redondo Beach, Calif. 90277.

## Datec Unveils Three-Modem Line

CHAPEL HILL, N.C. — Datec, Inc. has announced the Personal Access Link (PAL) line, a series of three modem devices.

The PAL 103 is a Bell 103-compatible device with a speaker and an autocal unit. The PAL 212 is an asynchronous-only 212 device with speeds up to 1,200 bit/sec.

The PAL Plus modem is an integral modem compatible with the IBM Personal Computer, the IBM XT and the Compaq portable computer.

The PAL modems are priced at \$195 for the 103, \$449 for the 212 and \$599 for the PAL Plus. Datec is located at Suite 116, 200 Eastowne Drive Chapel Hill, N.C. 27514.

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## Emulation Device Eliminates Interface Board

LAS CRUCES, N.M. — K-Systems, Inc. has announced a Digital Equipment Corp. VT100 emulation printed-circuit module device said to eliminate the need for an interface board.

The TFL-100 provides an RS-170 composite video output, parallel channel to the computer, serial channel for a keyboard and auxiliary serial channel. The auxiliary channel can be used as a printer port, the vendor spokesman said.

Installing into a standard VT100 backplane and displaying at a rate equal to 75K bit/sec, the TFL-100 includes features such as 80 or 132 col. and nonvolatile setup parameters. The device is available for \$675.

More information is available from K-Systems, 3902 Lilac St., Las Cruces, N.M. 88005.

## Tellabs Unwraps Line Driver, Multiplexer

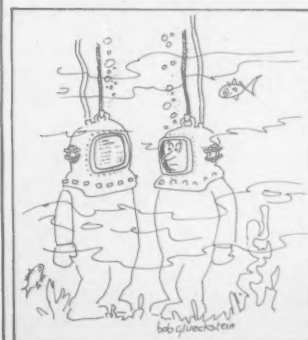
LISLE, Ill. — Two data communications products, an asynchronous line driver and a multiplexer, have been announced by Tellabs, Inc.

Tellabs' 3010 asynchronous line driver interfaces a remote terminal with a Tellabs 330 Dataplexer, 331 Xplexer or computer via a four-wire metallic transmission facility. The 3010 supports full-duplex asynchronous data transmission over four-wire facilities for distances up to two miles at 9,600 bit/sec or for longer distances at lower rates.

The line driver derives balanced differential transmit and receive signals via its internal circuitry at one end and accepts an EIA RS-232C-compatible interface at the other end. The 3010 can be switch-optional either DTE or DE configuration.

Tellabs' 330B Dataplexer allows up to 32 independent data channels to share a single composite data link interface. In addition to a standard RS-232C interface, the 330B features the Plexerlink interface, an integral digital line driver/receiver that provides 64K bit/sec communications over common wires for distances of a mile or more, the company said.

Tellabs' 3010 line driver costs \$100 each; the 8-channel 330B Dataplexer costs \$2,600. Tellabs is located at 4951 Indiana Ave., Lisle, Ill. 60532.



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150 North Hill Drive, Brisbane, CA 94005.

Convertible is a registered trademark of Paradise Systems, Inc.

# PARADISE



# Monroe Systems Unwraps 16-Bit Intel-Based Micro

MORRIS PLAINS, N.J. — Monroe Systems for Business, a subsidiary of Litton Industries, Inc., has announced the System 2000, a 16-bit microcomputer based on Intel Corp.'s 80186 microprocessor.

The vendor claims the system is three times faster than other commercially available microcomputers.

The System 2000 comes with Digital Research, Inc.'s CP/M 86 and Microsoft, Inc.'s MS-DOS operating systems. A basic system includes a CPU, two built-in, dual-density floppy disk drives with a capacity of 640K bytes per drive and a basic main memory capacity of 128K bytes. Main memory is expandable to 896K bytes, and disk capacity can be expanded to 20M bytes with the addition of an optional 10M-byte hard disk drive.

The unit is equipped with a 12-in. amber monochrome CRT terminal with a 2,000-char. capacity. Character display can be standard, reverse, underlined, high in-

tensity, blinking, nondisplay white and nondisplay black. The keyboard has a standard typewriter layout with a separate keypad, the vendor said.

Ten application-defined function keys are included on the system to allow up to 40 different functions. Four user-defined program keys are also included, the vendor said.

Integrated into the System 2000 are two RS-232C serial ports with programmable transmission rates to support asynchronous or synchronous protocols at speeds ranging from 75 bit/sec to 19.2K bit/sec.

A parallel printer port and five expansion slots are included with the system. The system was designed to support Basic, Pascal, Fortran, Cobol and C programming languages, the vendor said.



The Monroe System 2000

A basic System 2000 costs \$3,695, the vendor said from Monroe Systems for Business, The American Road, Morris Plains, N.J. 07950.

CATEGORY	MICROS	CRTs
Reducing the Mainframe Load	8	0
Independence of Other Devices	10	0
Price/Performance	7	4
Security	6	6
Geography	8	4
Ease of Use	8	7
TOTAL SCORE	47	21

Usefulness of Microcomputers vs. CRT Terminals

Source: Lavenhol & Horvath

## Memorex Tape Drive Boasts Size, Shape Of 5¼-In. Floppy

SANTA CLARA, Calif. — Memorex Corp. has announced a 130M-byte, dual-mode, ½-in. tape cartridge drive that has the same size and shape as a 5¼-in. floppy disk drive.

Called the Model 1110, the unit was designed to provide backup for Winchester disk drives used with microcomputers.

The 1110 provides both start/stop and streaming modes of operation. A proprietary tape-picking system is used to pull the tape from the cartridge and onto an internal take-up reel. The drive then operates in a reel-to-reel mode.

The drive has a 130M-byte capacity in streaming mode, where it can operate at 75 in./sec. In start/stop mode, the unit can operate at 50 in./sec and can store up to 83M bytes of memory.

The unit is capable of searching and rewinding at 150 in./sec and can transfer data at 225K byte/sec in a streaming mode, according to Memorex.

The self-threading cartridge uses 400 feet of tape in a sealed housing.

The drive's cost begins at about \$1,000 per unit. The vendor is located at San Tomas at Central Expressway, Santa Clara, Calif. 95052.

## Price-Performance Gap Blurring Between Micros, CRT Terminals

Second of Three Parts

By Eric B. Jacobs and  
Allen Sneider  
Special to CW

The business world has undergone not an evolution in the way computers are used in business, but a revolution. All of this has resulted from the development of something as tiny as the semiconductor chip, combined with some creative, problem-solving software.

It is helpful to contrast this generic history of micros and business software with a quick look at CRT terminals. While micros have been available for some time, there were significant limiting factors that made their use awkward and which restricted them to either the forward-thinking or those with the time and inclination to play with the new toys.

In contrast, CRT terminals have been around long enough to allow develop-

*'Price has... been a significant factor in delaying the spread of micros vs. CRT terminals. [But] the price gap between micros and CRT terminals has been rapidly narrowing.*

ment of user-friendly software. However, business users of mainframe hardware and CRT terminals have been dependent on mainframe vendors for applications software. A cottage industry has developed for writing software for microcomputers. These software tools have spurred the hardware development of the micros, making them cheaper, more powerful and more useful.

Hardware changes occurred more slowly in the CRT terminal market. The reason  
(Continued on Page 122)

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# Uses an Enhanced Version of Unix

## Dual Systems Inaugurates 16-Bit 83/80 System

BERKELEY, Calif. — Dual Systems Corp. has introduced a 16-bit computer system that uses an enhanced version of the Unix operating system.

Called the 83/80, the system has 512K bytes of dynamic random-access memory, expandable to 3.25M bytes. It also includes an industry-compatible storage module device disk controller that reportedly yields average transfer rates of 800K byte/sec in read mode and 560K bytes in write mode. The controller supports either one or two 80M-byte hard disks.

Backup memory consists of an 8-in. floppy disk drive with 1M byte of storage capacity. A 9-track, 1,600 bit/in. tape drive system is also available, complete with Unix tape driver software. Approximately 35M bytes can be stored on tape in Ansi/IBM form, according to

a spokesman for the vendor.

The system's four-channel serial RS-232C I/O boards use direct-memory access for all output for enhanced system throughput. Two additional serial I/O boards may be added for a total of 12 ports.

The C programming language comes standard with Unix, which incorporates enhancements from the University of California at Berkeley. Optional languages include Fortran-77, Pascal, Basic and RM/Cobol.

A real-time operating system is available.

Application software includes word processing, electronic spreadsheet and a relational data base management system, a spokesman said.

The 83/80 is available now for \$20,990, which includes Unix, an 80M-byte disk and a one-year warranty.

More information is available from Dual Systems, 2530 San Pablo Ave., Berkeley, Calif. 94702.

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Vantage has a VPlus monitoring system that reports on response times, provides a VPlus message handler, controls access to terminals and applications and measures the efficiency of terminal usage. The monitoring system also includes a program debugging facility.

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# CRT Terminals Seen Catching Up With Micros

(Continued from Page 117)  
is that there was not much impetus to change until the relatively recent studies of human factors that created an entirely new buzzword for use in discussing workstations — ergonomics. That simply means that if a person is going to use a micro or a CRT terminal for an extended length of time, he should be protected from harmful radiation, excessive eyestrain and poor posture.

Changing information processing methods and policies is not easy for any company that has made a significant investment in human and financial resources to develop a workable system. Many firms have held back micro investments until there was absolute proof that it could be cost-justified and that micros fit in with overall corporate policies.

## Lack of Communications

Another factor that had significantly held back the use of micros was the lack of good communications software. The early micros were reasonably good at communicating with an identical twin (another model of the same computer), but that was about the limit — "user-friendly" communications is a very new thing.

In contrast, CRT terminals were never expected to communicate with anything other than a mainframe computer, and the communications were completely handled by the mainframe.

Price has also been a significant factor in delaying the spread of micros vs. CRT terminals. The price gap between micros and CRT terminals has been rapidly narrowing. With IBM becoming the de facto standard, there is a highly competitive marketplace evolving. Certainly, CRT terminals are also getting cheaper. Eventually, micros and CRT terminals may be indistinguishable.

Perhaps this would be a good time to break from a history lesson and define some terms. The term "micro" means any device with its own self-contained memory and local storage. The term "CRT terminal" means any device that is dependent on another computer to perform its processing and/or storage.

There are six major areas where CRT terminals can be compared with microcomputers: mainframe load, independence, security, price, geography and ease of use.

The chart on Page 117 is an admittedly biased rating based on a scale of zero through 10 for each of our six categories.

Probably the most significant

area where microcomputers have a huge advantage over CRT terminals is in considering the load on a company's mainframe computer.

If you can function independently of your co-workers, you are in control of when your work gets done. If, because you and all of your co-workers need to do work requiring the computer between 2 p.m. and 5 p.m.,

the system's average response time would have to increase if you were all using CRT terminals. If the increase was dramatic enough (say to a 3- to 5-second response time) you could kiss your productivity goodbye.

Sure, if you need some data that someone else created to help you make up your budget, for example, you need to have access to it. The magic of a microcomputer is

in letting you work on it independently of the mainframe once you have retrieved the needed information. Also, by eliminating your dependence on the mainframe, you are not inconvenienced by untimely system crashes, system overloads or system backups.

The price/performance ratio of micros is rapidly decreasing. A small micro capable of performing the

ordinary business functions of word processing, spreadsheets and communications, can now be purchased for under \$2,000.

Jacobs is the national director for information and data processing for Laventhol & Horwath, a certified public accounting firm headquartered in Philadelphia.

Sneider is a partner in Laventhol & Horwath's Boston office.

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# Records Retention Stressed for Info Managers

By Jean Ciura  
Special to CW†

Record managers have long recognized that the vitality and existence of a corporation depends upon how well it manages and utilizes its information.

This information takes various forms, from paper to magnetic tape. However, the content, not the form, determines the value of each record and the programs. Cor-

porate management must evaluate these records, adopt policies to preserve or destroy them regularly and create a complete and consistent program for record retention.

The cornerstone of this program is the corporate records-retention schedule. The schedule itself is a simple document that outlines retention, maintenance and destruction guidelines for

*'Managers concerned with the information practices of their corporation face an awesome task. Often, beginning a [records management] program can be as difficult as completing it successfully.'*

each major record series. A record series is a body of information, in any form, that serves a common and unique function for a corporation. The schedule is designed

in particular as:

- A list of all corporate records that serve various functions in all corporate departments and divisions.
- An authorized state-

ment for projected retention, transfer and destruction of records.

• A timetable for the process of aging, recycling and storage of records.

• A vehicle for the continual appraisal of retention requirements, including administrative, state and federal regulations.

Retention schedules are also complete programs, including inventories and appraisals, systems designs and protection planning. These programs are started by a corporatewide appraisal and inventory of inactive and active records retained and generated in each department.

Managers should assign staff members who are familiar with the record generation practices of each department to collect this data. Often, consultants are retained by larger corporations to prepare the inventory and draft a schedule.

## Basic Information

In any event, the inventory of corporate records must include basic information on the record series, including a complete description, inclusive dates and the size of the record retained in active and inactive areas.

Inventory data should also appraise the existence of duplicates, problems in file management and the importance these records have in the relation to the activities of the corporation as a whole.

The inventory must indicate whether any documents have been destroyed in the record series so that supporting documentation can be retrieved and saved for future use.

Once this data has been collected and organized, the draft schedule is prepared. This schedule should list each series by department and the recommended retention periods for active storage and destruction. Special instructions for microfilming, transfer and vital-records scheduling may also be included. The draft schedule is distributed to departmental managers, corporate representatives and legal counsel.

(Continued on Page 126)



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# CAD Workstation Announced for Drafting Sites

TULSA, Okla. — Bruningcad, Inc. has announced Spectra, a computer-aided design (CAD) workstation designed to adapt to a variety of drafting environments.

The modular configuration of Spectra features a compact pod that houses an expandable CPU, incorporating a Motorola, Inc. 68000 microprocessor; a 14.5M-byte Winchester disk drive; a dual 3½-in. disk drive; and a

drawer for disk storage.

The system also features a 19-in. color CRT monitor that is suspended above the user's work area by a moveable arm.

Users access the system with either a four-button mouse or a modular keyboard. A D-size plotter, with a media storage compartment, is also included as standard equipment.

Spectra is compatible with

all previous Bruningcad systems and is expandable into larger networked arrangements. It supports the firm's Easydra2, a two-dimensional mechanical drafting pack-

age, and Arcade, an architectural design package. It will also be able to support a soon-to-be-released, three-dimensional design and analysis package, according

to a spokesman for the firm.

More information on the system, which costs \$45,900, is available from Bruningcad at 6111 E. Skelly Drive, Tulsa, Okla. 74135.

## Printer Allows Mobile Output

FOSTER CITY, Calif. — Teletex Communication Corp. has introduced an 80- to 132-col., 3-lb, battery and

ac-powered thermal matrix printer that makes mobile output possible for users of portable and hand-held com-

puter systems using an RS-232 interface.

The 1280 Portaprint uses rechargeable or replaceable 6V batteries that provide between 4,000 and 5,000 lines of print. The printer may also be powered through a standard ac outlet.

In the battery mode, which enables users to operate the unit in remote, powerless locations, the bidirectional printer features up to 40 char./sec print speed. Powered through an ac outlet, the speed reportedly can be double.

Portaprint can produce a variety of character sizes and densities, as well as specialized letter, line and dot-by-dot placements, the vendor said.

Portaprint features graphics printing for charts and graphs; condensed printing, which enables users to place 132-col. spreadsheets and other wide printouts within standard 8½-by-11-in. paper; bold or shadow printing, a feature that is generally used to highlight headings; and oversized printing, a feature that enlarges characters to any height or width needed.

The Portaprint is priced at \$199; the vendor expects to begin volume shipments in the second quarter of 1984. Teletex Communications is located at 3420 E. Third Ave., Foster City, Calif. 94404.

## Monitor Fits IBM Micro

LOS ANGELES — Roland DG has introduced the MB-122 monitor, a monochrome CRT device said to be compatible with the IBM Personal Computer.

The monitor features a nonglare screen, full 2,000-char. display, 720- by 350-pixel resolution and a panel brightness control.

Dimensions of the MB-122 are 12.4 in. by 14.2 in. by 14.2 in. The input terminal is a nine-pin video jack, which is included with the monitor, the vendor said.

Amber and green-phosphor CRTs are available. Prices are \$240 and \$225, respectively, according to the vendor.

Additional information is available from Roland DG at 7200 Dominion Circle, Los Angeles, Calif. 90040.



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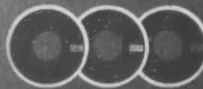
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## Records-Retention Program Seen Vital for Info Managers

(Continued from Page 123)

sel for their appraisal and authorization.

Authorizations on retention periods must be assigned on the following basis:

- **Administrative requirements:** The immediate user must determine how long the record is needed in an active state and the rate of retrieval normally assigned to the record.

- **Fiscal requirements:** The accounting manager or corporate treasurer will appraise the fiscal requirements of the corporation and the necessary documentation for reporting to state and federal agencies. Fiscal retention requirements for each state must be carefully applied. In addition, these retention periods must be suspended in case of an audit, and managers must be prepared to amend the schedule accordingly.

- **Legal requirements:** This appraisal can be completed only by the corporate legal counsel, a secretary or a member of the executive board. All records relating to the concerns of ownership, licensing, patents and product are included in this appraisal. Special concern should be directed to vital-records protection by the corporate advisers once the basic legal retention periods have been applied.

### Targeted for Destruction

Once the final schedule has been prepared, all records must be targeted for destruction. This process includes the orderly transfer of records to storage, the indexing of storage areas and the eventual authorized destruction of inactive records. Management should also adopt a records-management program for the proper creation and utilization of corporate information, including forms and reports design, vital-records protection and disaster-recovery planning.

It is best that these responsibilities be assumed by the manager of information services and the director of administrative services. Assuming this task, they must coordinate the records-management activities of

each department to protect the vital records in a secure manner.

Several forms of protection are available for vital records. Storing the original or duplicate in an off-site center is most preferred by records-management professionals. The vital records must be cycled off-site regularly.

Once the period of retention has expired, these records may be returned to a company storage center for the duration of their retention. Underground vaults or professional off-site centers may be used by corporations. However, managers must evaluate professional off-site centers carefully.

It is impossible to outline here all the elements in a corporatewide records-management program, but the basic aspects of such a program have been described briefly. Managers concerned with the information practices of their corporation face an awesome task. Often, beginning a program can be as difficult as completing it successfully.

### General Guidelines

What follows are some general guidelines to beginning the records-management program area:

- **Managers should enlist the active cooperation and support of corporate executives.** Often, a consultant is requested to address the needs of a management program and outline the particular phases of the project.

- **There are no easy remedies or quick solutions;** records-management programs depend upon the careful appraisal, retention and preservation of corporate information. Each phase outlined above must be completed carefully by staff members.

- **Information management is a complete system;** no scheduling program can operate by itself. Schedules are designed to be revised and amended. Legal counsel and fiscal managers must inform the responsible party when any action occurs that may affect the destruction of corporate information.

- **Any records-management program, to be effective, must involve every corporate department and division.** Partial measures are not effective or lasting.

- **If the corporation does not have the expertise to design such a system, advice should be sought from outside sources.** Professional associations can recommend experts in the fields of records management, systems design and disaster-recovery planning.

The most important aspect of any management program is for managers to address needs before a corporation is involved in an unfortunate situation, such as patent infringement, product liability, licensing disputes or tax audits. Prevention is the cure for neglected information programs.

Ciura is a consultant with Record Controls, Inc. in Addison, Ill., and is co-authoring the company's forthcoming publication on record-retention scheduling.

## Discmaster II Fits Apple II

BROWNSBORO, Ala. — Data Cue, Inc. has introduced the Discmaster II board, said to allow the user to connect two 8-in. or two 3½-in. double-density disk drives to Apple Computer, Inc.'s Apple II or compatible microcomputers.

The package includes software drivers, which run under Apple's DOS 3.3, Pascal 1.1 and Microsoft, Inc.'s version of Digital Research, Inc.'s CP/M operating system. These drivers allow the user to use existing disk drives in concert with drives controlled by the Discmaster II board, the vendor said.

The package includes installation and integration instructions and costs \$265, the vendor said.

Further information is available from Data Cue, 5696 Highway 431 S., Brownsboro, Ala. 35741.

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## Desktop Dot Matrix Printer Boasts Daisywheel Quality

NEWBURY PARK, Calif. — Advanced Matrix Technology, Inc. (AMT) has introduced a desktop dot matrix printer designed to eliminate the need to purchase separate hard-copy output devices for word processing, spreadsheet, graphics, general accounting and overhead transparency output.

The AMT Office Printer reportedly offers business users the print quality and flexible paper-handling capabilities of a daisy-wheel printer with the speed, multiple font support and performance characteristics of a dot matrix device. There are three print-

ing modes: letter-quality output at 45 char./sec, draft quality at 100 char./sec and high-speed data processing at 250 char./sec.

Courier 72, Letter Gothic 12 and Gothic 17 fonts are provided as standard features. Optional fonts include proportional, scientific OCR-A for optical encoding, Code 39 for bar-code applications and foreign languages. Font generation software is also available for creating custom fonts.

The AMT Office Printer with black ribbon costs \$3,195. AMT is located at 1157 Tourmaline Drive, Newbury Park, Calif. 91320.

## Adaptec's Winchester Drive Supports Up to Seven CPUs

MILPITAS, Calif. — A 5¼-in. Winchester disk drive controller designed for multiuser, multitasking microcomputer operations has been introduced by Adaptec, Inc.

The ACB-5500 controller can support up to seven host CPUs and four disk drives, including fixed or removable drives, the vendor said.

Other features of the controller include command chaining, which allows several controller commands to be executed with one host command; noninterleaved operation, so all information on a given track can be accessed on one rotation of the disk; enhanced 32-bit ECC polynomial plus parity; and reserve/release capa-

bilities to support shared file and shared disk applications.

In addition to the controller, Adaptec is offering a very large-scale integration three-chip set, the ACS-5500, which enables users to license and manufacture the controller board.

The ACB-5500 is priced at approximately \$300. Further information is available from Adaptec, which may be reached at 580 Cottonwood Drive, Milpitas, Calif. 95035.

## Trilog Extends Colorplot Line Of Printers

IRVINE, Calif. — Trilog, Inc. has introduced Colorplot-II, the latest addition to its nonstop-printing family of line printers.

Colorplot-II provides 75 to 300 line/min printing, two pitches of compressed printing, DP and letter-quality printing. Colorplot-II is software-compatible with the company's original Colorplot model, the vendor said.

Trilog's dual print head nonstop-printing concept provides a backup print head, with the second head continuing to print at half speed if the other print head fails, according to the vendor.

Colorplot-II produces up to 256 colors by making three passes over the page. By interspersing dots of the primary colors, the entire spectrum of colors can be printed, the company said.

The cost of Colorplot-II is \$6,900, with quantity discounts available. Additional information is available from Trilog, 17391 Murphy Ave., Irvine, Calif. 92714.

## Electronic Drive From Dilog Eyes IBM Micros

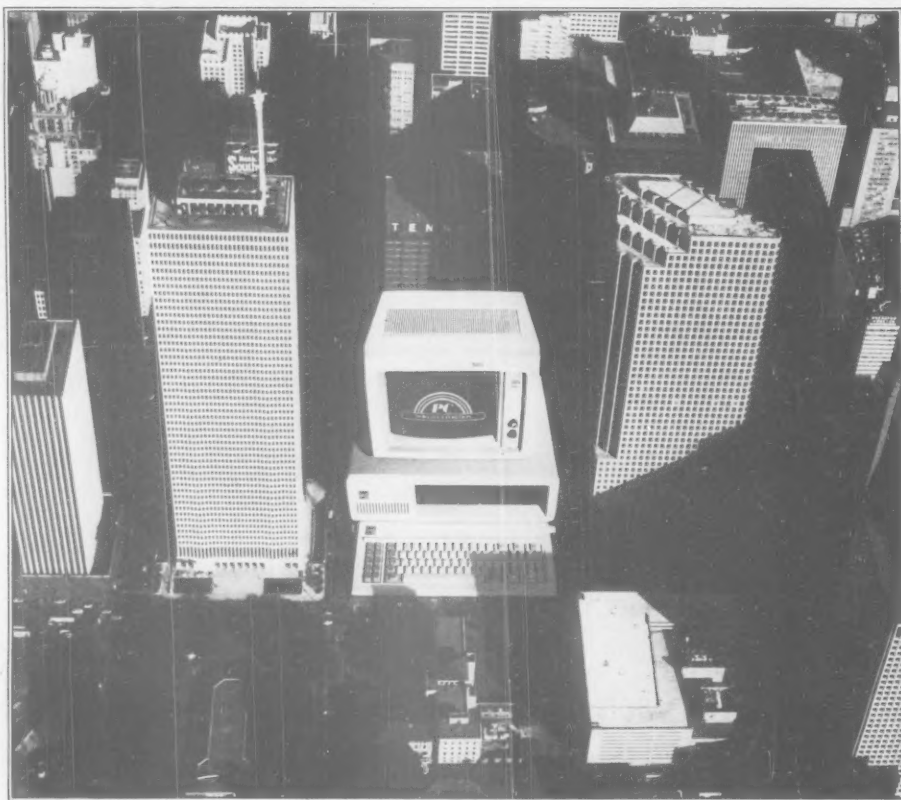
GARDEN GROVE, Calif. — Dilog PC Products, a division of Distributed Logic Corp., has introduced an electronic disk drive for the IBM Personal Computer and Personal Computer XT.

The unit is said to be a compatible, hardware-implemented, random-access memory-based replacement for the XT's floppy disk drives, the vendor said.

The unit plugs into any I/O slot of the Personal Computer or XT and offers data access and up to 50 times faster throughput than floppy disks, the vendor claimed.

According to the vendor, the unit allows continuous scrolling of documents, instantaneous look-up of records, high-speed sorting of data and other disk-bound processes to proceed without the start-stop aspect of typical floppy disk operation.

Priced at \$1,595, delivery is available in 30 days. More information is available from Dilog PC Products, 12800 Garden Grove Blvd., Garden Grove, Calif. 92643.



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Volkswriter is a registered trademark of LIFETREE SOFTWARE, INC.

## Planning Ahead Can Minimize Risks of DP Disaster

By Nidal Jedeed

Special to CW

Preventing physical disasters in DP centers does not have to be a matter of luck. A number of steps can be taken to minimize the risks and keep DP staff under control.

In the context of physical security, the risk factors are spelled out in most computer manuals under the titles "Operating Specifications" or "Operating Environment."

Specifications for operating a computer system safely include: temperature, humidity and power requirements.

The effects of exceeding a vendor's specifications can vary from

stressing hardware (resulting in higher maintenance costs and downtime) to considerable equipment damage. In some cases, the complete destruction of the computer and its peripherals is possible.

In one case, an air-conditioning failure in an unattended computer center caused the temperature to exceed 120° F. This resulted in extensive damage to disk drives and memory boards.

After identifying the risk factors, careful consideration must be given to the installation of a system to monitor the total computer environment. Desirable features in such a system include:

- All sensors in one package. This eliminates the multiple supplier and interfacing problems.

- A central panel to display current status of alarms. This eliminates the confusion of multiple alarms.

- Display of current temperature and humidity with site-selectable alarm thresholds.

- Remote alarm capability.

- An automatic dialer to call and deliver alarm messages at remote locations such as the security office or the homes of DP staff.

- Interrogation of the monitoring system remotely by DP staff via telephone.

- Capability to delay or pre-

vent automatic power-up to the computer system after blackouts or brownouts to minimize power surges and allow an orderly computer power-up.

- Capability to shut down the computer automatically if corrective action is not taken within a specified time limit.

One still might say that a disaster is really a matter of luck. That might be true, but taking the above steps will load the dice in your favor. You may not have to say, "It wouldn't have happened if only we had..."

Jedeed is operations manager of innovations for Control, Inc. in San Jose, Calif.

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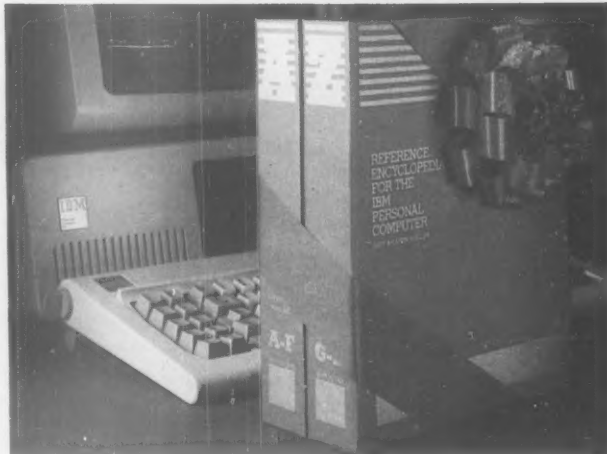
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The Encyclopedia tells everything the reader needs to know about DOS (including 2.0). And it covers the PC and XT™ so thoroughly that buying technical and hardware manuals becomes unnecessary. It details topics like disk organization, printer control and more.

It realistically reviews IBM and non-IBM programs and add-ons so readers won't get trapped in the software/hardware jungle. And shows dozens of other ways to get the most out of one's PC.

What's more, the PC Encyclopedia is updated twice a year to keep its readers up to speed on all the new developments.

Suggested retail price for the PC Reference Encyclopedia (including one year of free updates) is just \$69.95\*



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## Plug-In Module Ties Printers To IBM Minis

ARLINGTON, Mass. — Interface Data Electronik, Inc. has introduced a plug-in interface module said to make Qume Corp. Sprint 11 Plus daisywheel printers compatible with IBM System/34, 36 and 38 minicomputers.

The Interface Module Q IBM 34-38 is integrated into the printer and enables coaxial connection, including cable-through attachments. It connects locally via coaxial cable or remotely to an IBM 5251-12 CRT terminal. Emulation of IBM 5225 and 5256 printers is possible, the vendor said.

The printer is a low-profile, desktop unit available in alternative models with printing speeds of 40 or 55 char./sec with automatic bidirectional printing. The printer utilizes Qume 96-char. print wheels. More than 130 type styles are available, the vendor said.

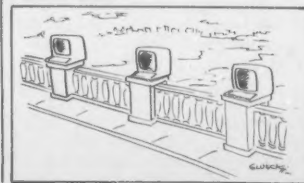
Prices for the product start at \$3,790. More information is available from Interface Data Electronik, 1365 Massachusetts Ave., Arlington, Mass. 02174.

## I/O System Connects Readers to IBM Micro

SAN GABRIEL, Calif. — Addmaster Corp. has announced an I/O system (including cables and programs) said to make its 510 Reader Punch, the 612-2 Reader Transmitter and the 651-2 Reader Transmitter Spooler usable with the IBM Personal Computer RS-232C port.

The system reportedly gives the user the capability of reading and punching tapes in Ascii, EIA or Baudot code or as a straight hexadecimal number, the vendor said.

The programs cost from \$50 to \$100; the cable costs \$39.75. Addmaster said from 416 Junipero Serra Drive, San Gabriel, Calif. 91776.



# Electronic Notebook Unit Announced by Datec

COLORADO SPRINGS, Colo. — Dated, Inc. has announced the Electronic Notebook, a battery-powered, immersible, portable

data capture and processing unit.

Designed for data capture with editing and processing in harsh environments, the

unit features ruggedized construction, full Basic programmability and up to 504K bytes of main storage used for processing and as a solid-

state disk. Bidirectional transfer of programs and data files with a host computer is standard.

Removeable batteries, rechargeable in the unit or in a separate charger, power the unit from 16 to 30 hours of field operation. Rechargeable backup batteries protect the contents of memory and can drive the real-time clock for over 90 days, the company said.

The Electronic Notebook includes a full alphanumeric keyboard, 80-char. display and two RS-232C I/O channels. An optional bar code scanning wand is available for applications such as inventory, production monitoring and vehicle fleet control.

The unit costs \$3,295 from Dated at Suite 2114, 2860 S. Circle Drive, Colorado Springs, Colo. 80906.

## Onyx Cuts Cost of Service Program

SAN JOSE, Calif. — Onyx Systems, Inc. has lowered the price of its Professional Service Program by 25%.

The service program, which applies only to new Onyx equipment, covers installation, on-site warranty repairs and on-site service for one year, including parts and labor.

The on-site service is provided by RCA Data Services with Onyx directly accountable for the service. RCA has approximately 400 service technicians nationwide and maintains a stock of spare parts for Onyx equipment.

On-site service is available between 9 a.m. and 5 p.m. Monday through Friday, with a response time within 24 hours. An option is available for 24-hour coverage,

365 days a year.

The cost varies according to the user's system, and prices start at \$800.

The vendor, a manufactur-

er of multiuser 8- and 16-bit microprocessor-based business systems, is located at 25 E. Trimble Road, San Jose, Calif. 95131.

## Newsletter Introduced For Lawyers

LARKSPUR, Calif. — Law Office Guide in Computers (Logic) has introduced a monthly newsletter specifically for lawyers and legal administrators.

Logic also announced the availability of its "Law Office Guide in Computers 1984 Directory."

The independent newsletter, which accepts no advertising, reportedly features articles and reviews on a wide range of computer topics of interest to law firms, including hardware, software, systems, word processing, telecommunications and product announcements.

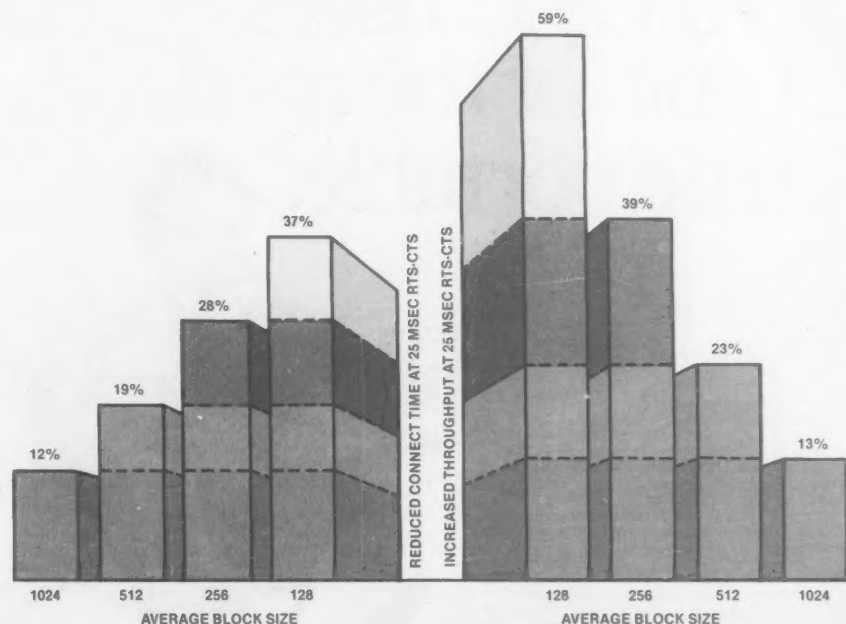
Also included are user interviews, purchasing guidelines, consultants, reader exchange, "Tips of the Month" and information about publications, conferences and other trade shows, according to the vendor.

The 1984 directory is said to contain detailed product and service listings and is cross-referenced with a guide and three types of indexes to facilitate its use.

An annual subscription to the newsletter is \$120. The directory is \$10.

A charter subscription to both publications saves \$30, according to a spokesman for the firm.

Logic can be reached through P.O. Box 701-B, Larkspur, Calif. 94939.



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# Medical Practice System Based on Mumps

NEW YORK — Creative Socio-Medics Corp. has introduced a Mumps-based medical practice management system.

Called the Comprehensive Medical Practice System (CMP5), it supplies the medical provider with management information processing, including patient history, third-party claim processing, billing and accounts payable, according to

a spokesman for the vendor.

The practitioner can reduce Medicaid claim processing from an average of 40 days to 10 days through use of an acceptable magnetic media, the vendor said.

The system enables the medical provider with a minimum of training to begin with a single-station system and easily expand it to fit the needs of the practice, up to seven stations.

The system has a plug-in design and self-contained training module. Full system operation is achieved within four hours of self-training by the user, the vendor said.

The system includes a Digital Equipment Corp. Professional 325 desktop processor, a video terminal, detachable keyboard, dual disk drives, software and a dot matrix printer with tractor drive. Service and sup-

port are provided by Hotline 800 telephone service and free on-site hardware from DEC.

Features include multitasking, multiuser capability, table-driven functions and menu-driven screens, the spokesman said.

Optional add-on software modules include word processing, scheduling, graphics, general ledger, payroll, accounts payable and elec-

tronic spreadsheet, according to the vendor.

The \$9,500 price includes free on-site maintenance for one year from DEC, the vendor said.

More information is available from Creative Socio-Medics, 16 E. 32nd Ave., New York, N.Y. 10016.

## Printer Card Targets Apple Micros

BURLINGTON, Mass. — Texpint, Inc. has announced Print-It, a software-independent, color graphics printer/plotter card for Apple Computer, Inc.'s Apple II, II+ and IIe computers.

According to the vendor, all Apple graphics or text screens can be copied by any printer by pushing a button. The kit consists of the plug-in card, a push button, a printer cable and a small plug-in control board.

Print-It is priced at \$299.

Further information is available from Texpint, 8 Blanchard Road, Burlington, Mass. 01803.

## Keyboard Alternative To IBM Out

FRAMINGHAM, Mass. — Tang Data Corp. has introduced a DIN keyboard as an alternative to the IBM Personal Computer keyboard.

Designated the DIN-83, the keyboard features raised bump keys, according to DIN standards.

It features a capacity switch with an option for 15 additional function keys, the vendor said.

The keyboard is silent and has a replaceable key switch. Priced at \$269, DIN-83 is available from Tang Data, which is located at 100 Eames St., Framingham, Mass. 01701.

# IBM/DEC users get one for the road. A true portable.

What a party we had this past year! Our first cause to celebrate was the Model 203. It was light in weight, good-looking and user friendly. Its small size and 9" display were just what today's sophisticated crowd wanted.

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Next we uncorked a couple of successes in the form of built-in modem with dual host support, auto log-on and auto dial. But the frosting on the cake is these multi-purpose workstations can be used in clusters or stand alone and utilize just 35W. of power.

Yet what party is complete without "one for the road"? And ours was Model 207. A true portable that is SNA and DEC compatible and weighs only 14 lbs. Best of all, its sober price tag won't leave you with a hangover.

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# Utility Scores a First Fiber-Optic Cable Extends Local Net

By Jim Bartimo  
CW Staff

DES MOINES, Iowa — When Iowa Power and Light Co. wanted to extend its local-area network from one building to three, it used fiber optics to solve cabling problems unique to a company that deals with power cables every day.

Iowa Power is a gas and electric company based here that serves a quarter of a million customers in 26 counties throughout central and southwest Iowa.

Its local-area network handles the data from more than 345,000 electric and power meters and data entry for customer calls and credit arrangements. Through the use of the network, the firm was also able to provide on-line data processing for its billing and accounts receivables department.

When most companies start wiring buildings together, there is little problem with renting underground conduits. But Iowa power "already had high-powered wires on the right of way underground," so coaxial cable could not be laid next to it for fear of creating a fire hazard, according to the company's telecommunications manager, Roland Johnsen.

Microwave was not considered because "that's hard to deal with when you have a lot of tall buildings around," Johnsen said.

So, in order to extend its Datapoint Corp. Attached Resource Computer (ARC) local-area network, fiber-optic cable was used. "We were the first in Iowa to pull fiber-optic cable in high-voltage ducts," Johnsen said. In fact, the company is thought to be the first to extend an ARC

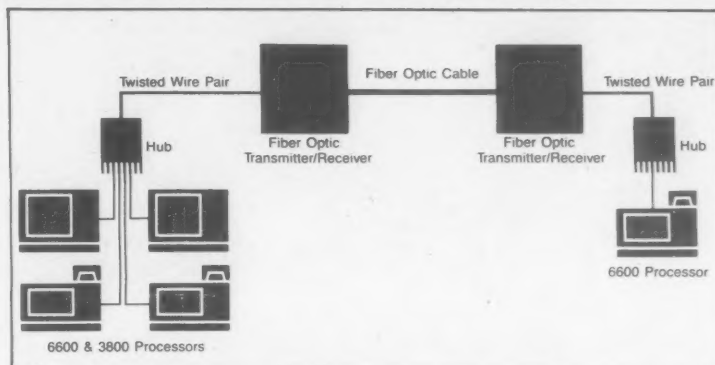


Diagram Courtesy of Datapoint Corp.

Iowa Power and Light ARC Local-Area Network

network to a fiber-optic network, according to a Datapoint spokesman.

Part of the reason for the extension was that the part of the company providing gas was broken into a second company. Although it is in another building, the gas company still uses the Datapoint equipment and the newly installed Burroughs Corp. dual processor for data entry applications, according to Bob Keefe, manager of system support.

Of the three buildings connected by the fiber-optic cable, two were one-third of a mile away and the third was more than a mile away. While the company has had the ARC network for four or five years, intrabuilding communications had been handled via 9,600 bit/sec lines and mo-

dems. The connection of fiber-optic cable to the ARC network was achieved through Datapoint's specially customized hubs and fiber-optic transmitters and receivers from Canoga Data Systems, Inc. (see diagram). Transmission now occurs at 2.5M bit/sec, Keefe said.

While Johnsen is completely satisfied with the operation of the network, Keefe said that sometimes a Datapoint environment is a disadvantage. "Even though Datapoint's electronic mail is good — planning for the future is difficult because there's not much software available."

Another disadvantage is that the more than 25 Datapoint terminals must communicate through the six Datapoint 6600 and one 3800 small business systems.

## Office Ware

Applied Microsystems, Inc. has announced **PC-Prof's**, an interface that allows IBM Personal Computer and Personal Computer XT users access to the mainframe electronic mail system. PC-Prof's permits the user to select items such as a file cabinet, in/out trays, note pad and trash can from a menu and facilitates document creation and retrieval and electronic mail.

The system requires an IBM Personal Computer or XT with color graphics and a modem. The user must have access to a mainframe supporting the IBM Professional Office System application.

The program costs \$250, with corporate licenses available at \$5,000, the vendor said, through P.O. Box 832, Roswell, Ga. 30077.

Megahaus Corp. has released an updated version of **Megawriter**, a word processor with mail merge, for the Apple Computer, Inc. Apple II and IIe microcomputers. Improvements include a faster boot time, settable tabs and the ability to read and write both Apple DOS files such as Visicorp's Visicalc print files. It costs \$99.95 from Megahaus, which is located at 5703 Oberlin Drive, San Diego, Calif. 92121.

Ceres Software, Inc. has released four software packages for the Radio Shack Model 100 portable computer. **Elf-Writer** features a viewing mode that permits the user to see how a document will be formatted before it is printed; **Elf1&1** features computational entry including an entry display, running total and memory as well as square root, percent, exponent

and change sign key; **Elf-Cop** is a file manager system; and **Elf-Banker** performs banking and financial calculations. Each package costs \$24.99 from Ceres Software through P.O. Box 1629, Portland, Ore. 97207.

Zenrad Controls Co. has released **Zen 3**,

*Recognizing the microcomputer's proliferation in the office, Computerworld will continue to publish microcomputer word processing, electronic mail and certain other types of software under this heading and section.*

a screen editor with a relocatable linker. It is written in Zilog, Inc. Z80 code and supports Digital Research, Inc.'s CP/M operating system. Two assemblers, a debugger, monitor, calculator, justification, printer support, file management, titles and page numbering are included.

It is available on 8-in. IBM 3740 or 5¼-in. North Star Computers, Inc. formatted diskettes for \$100 from Zenrad at 1575 APS, Santa Barbara, Calif. 93103.

Microart Corp. has announced **Image** word/graphics processor, Release 4.0, a screen-oriented word processing program that integrates graphics drawing capability for Digital Equipment Corp.'s Rainbow 100 personal computer. Image's features include the capability of simultaneously "windowing" any page from any other Image file and extracting from that page any section, regardless of location or graphic content for inclusion within any other file.

Image Release 4.0 runs under CP/M 86-80 on any Rainbow 100 personal computer having a minimum of 64K-byte memory. It costs \$295 from Microart, located at Suite 961, 200 Market Building, Portland, Ore. 97201.

Satellite Software International has released Version 3.0 of its word processing system **Wordperfect**. Confidential documents can now be locked or unlocked with a password known only to the user, and the option to eliminate single lines at the top or bottom of the page is included.

The list price of \$495 includes a spelling dictionary, math, automatic footnotes, text columns and a built-in print spooler that allows editing while printing.

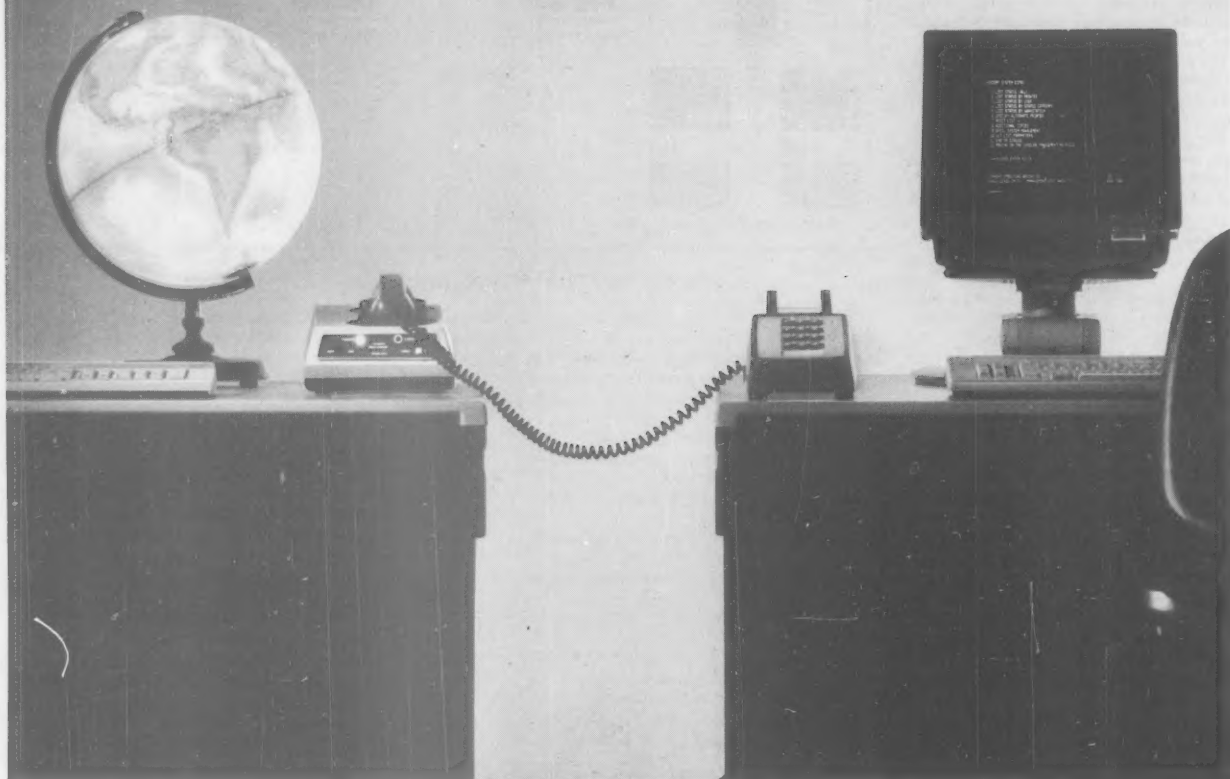
A version of Wordperfect for DEC's Rainbow 100 has been released by the vendor at 288 W. Center St., Orem, Utah 84057.

**Inview**, a mouse-driven software package that allows IBM Personal Computer users to access several applications through "windows" and exchange data among them is available from Graphicon Software, Inc. Inview works with almost any package written for PC-DOS Version 1.1 and 2.0.

A minimum number of windows requires 256K bytes of random-access memory. Inview operates with floppy or hard disk systems and will work with monochrome monitors.

It costs \$295 from distributors and dealer networks. Information is available from Suite 10, 399 Sherman Ave., Palo Alto, Calif. 94306.

# If you need support call one of the 386 offices below.



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# Of Software, Service Vendors

## Acquisitions Tied to Rising Capital Needs

By Bill Laberis  
CW Staff

A month ago, word was that Computer Corp. of America (CCA) was on the auction block, mulling the offers of suitors hungry for the company's Model 204 data base management system (DBMS), its market mainstay.

Pansophic Systems, Inc. and Management Science America, Inc. (MSA) were each rumored to have courted CCA, with Pansophic's interest getting to the offer stage. Their interest was not surprising, given the paucity of DBMS companies that could be considered for sale and the desire of mainframe applications and utilities software companies to branch into the DBMS area.

Nor was it surprising when CCA announced two weeks ago that it had, in fact, been acquired in principle by a Canadian insurance giant seeking to diversify into

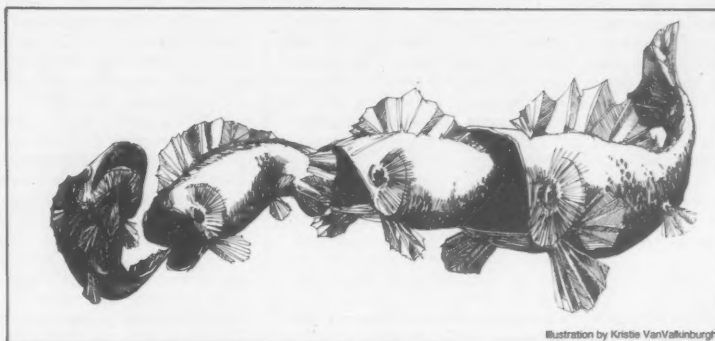


Illustration by Kristie VanValkenburgh

high-growth niches. What was surprising to some merger and acquisition watchers was the price paid by Toronto-based Extencare Ltd. for CCA — \$40 million.

"This [CCA] deal is a good example of what's happening in general regarding mergers and acquisitions of software and service companies," according to Ann Morley, who tracks acquisition activity for International Data Corp. (IDC), a Fram-

ham, Mass.-based market research firm.

"There are more deals than ever being put together, and the dollar value of a typical deal is increasing," Morley said. "There's a push to become a one-stop shop in [software], which makes a company like CCA very attractive and helps bid up its acquisition price . . . With today's capital requirements beyond the means of many

(Continued on Page 144)

## Software Marriages Seen Leading Rush To Acquisition Altar

By Bill Laberis  
CW Staff

"Marriage is a great institution, if you marry the right girl."

In this way, Gilbert Mintz, a partner at Broadview Associates, a Fort Lee, N.J., mergers and acquisitions marriage-maker, summed up the hot acquisitions environment in the \$26 billion software and services industry.

This year will witness more such corporate marriages than ever (see related story), with a rush to the altar likely in the remaining six weeks of the year, analysts predict.

One of the hotter acquisition candidates had been the data base management system (DBMS) vendors, two of which — Mathematica, Inc. and Computer Corp. of America (CCA) — were bought up in the last four months. But in the DBMS area now, the number of potential suitors outstrips the number of companies that can be considered

(Continued on Page 144)

## Bizcomp's Patent May Cause Legal Bind for Modem Makers

By Robert Batt  
CW West Coast Bureau

SUNNYVALE, Calif. — Scores of users and manufacturers of command-driven modems may shortly find themselves in a legal bind as a result of a patent recently granted to Michael Eaton, president of Business Computer Corp. (Bizcomp), based here.

High-speed modem manufacturers such as Racal-Milgo, Inc. and Codex Corp., as well as firms that incorporate command-driven modems in their products, are likely to be affected by the patent, industry sources claimed.

In fact, one major manufacturer, Hayes Microcomputer Products, Inc., has already signed a licensing agreement with Bizcomp, under which the Atlanta-based firm will reportedly pay several million dollars to Bizcomp in return for use of the modem

(Continued on Page 138)



Michael Eaton

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## HP Reports Strong Earnings Gains For Fourth Quarter and Year

PALO ALTO, Calif. — Hewlett-Packard Co. recently reported strong earnings gains for both the fourth quarter and the year, touching off a stock trading spree that bid up the company's stock.

Earnings for the year were up 13% to \$432 million, or \$1.69 per share, compared with \$383 million, or \$1.53 per share in 1982. Sales in the period totaled \$4.7 billion, up 12% from the \$4.2 billion revenue mark posted the previous year.

For the quarter, earnings rocketed 32% to \$147 million, or 57 cents per share, up from \$111 million, or 44 cents per share.

Fourth-quarter orders of \$1.3 billion were 26% greater than orders from the same period a year ago. Domestic orders were particularly strong, up 33%. The company reported that orders for its touch-screen personal computer, the HP 150, are meeting company expectations, with HP having signed on key franchisees.

Commenting on HP's results, John A. Young, president and chief executive officer, said, "We continue to see strength in the order picture, particularly in the U.S. . . . However, we have yet to see significant improvement in international order levels."

## For Customer Acquisitions

## HP Finance Co. Established

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the establishment of a wholly owned subsidiary, the Hewlett-Packard Finance Co., designed to finance its customers' equipment acquisitions.

HP has also formed a financing and remarketing division to market and administer all HP product leasing and the resale of HP computers.

The new entities were designed to help meet interest in leasing HP equipment for medical, analytical, computer and test and measurement equipment, the company said.

In the past, the company entered into financing contracts with customers wanting to lease equipment and funded the contracts through ar-

rangements with commercial banks. The new subsidiary will enable HP to offer its customers competitively priced financing and better accommodate growth anticipated in its customer-financed activities.

Joseph A. Barr, former sales finance manager at HP, has been named president of HP Finance, while Donald Schmickrath, former controller for the Business Development Group and the Information Products Group, has been named general manager of the financing and remarketing division.

Commenting on the newly formed operations, Barr said, "By tapping the public-debt markets, we hope to lower significantly the cost of financing our programs for customers," adding that HP expects to finance its operation with commercial paper and medium-term notes.

## Tandem Reports Slow Growth, Flat Earnings

CUPERTINO, Calif. — Earnings growth slowed considerably at Tandem Computers, Inc. in fiscal 1983, with the company reporting virtually flat earnings of \$30.8 million, or 76 cents per share, compared with \$29.8 million a year earlier.

Total sales in the period also reflected slowing overall growth throughout the year, rising 34% to \$418 million, up from \$273 million in 1982. Growth in both earnings and sales were below the quantum leaps that characterized Tandem's financial results in recent years.

For the fourth quarter, profits rose 5% to \$8.8 million, or 21 cents per share, up from \$8.3 million the same period a year earlier. Sales in the quarter rose 35% to \$101 million, compared with last year's sales of \$76 million.

James Treybig, company president, said the company achieved success in asset management and inventory control during the year. He also said Tandem has begun production of its TXP, a 32-bit version of its Non-stop line of fault-tolerant processors.

## Equatorial Bids For Satellites

MOUNTAIN VIEW, Calif. — Equatorial Communications Co. has applied to the Federal Communications Commission (FCC) for permission to construct, launch and operate two communications satellites that would expand the company's data network services.

Equatorial provides its customers with satellite data communications networks, which include 2-ft diameter receiving dishes called micro earth stations to which data is beamed from satellite transponders the company currently owns aboard Western Union's Westar IV satellite.

The proposed \$200 million Equistar satellite system, if it is approved by the FCC, would be launched from the U.S. space shuttle in 1987.

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# Modem Mart at Bizcomp President's Command?

By Robert Batt

CV West Coast Bureau

The granting of U.S. Patent No. 4,387,440 to Business Computer Corp.'s (Bizcomp) president, Mike

## Modem Patent May Put Users, Vendors in Bind

(Continued from Page 135)

design technologies covered by the patent.

"After making several patent searches, we felt that some of the modems manufactured by Hayes clearly fell within the claims of the Eaton-Bizcomp patent. When we looked at whether we should contest the patent, we felt that the legal process involved would be long and arduous and that the market offers too much potential to be slowed by legal action of that kind," explained Scott Hobby, attorney for the Atlanta law firm of Powell, Goldstein, Frazer and Murphy, which represented Hayes in the case.

### Protects Basic Techniques

According to Bizcomp, the patent protects basic techniques used to control command-driven modems, including most of the current generation of autodialing modems widely used on terminals and computers, as well as modems with serial interface capabilities (as opposed to bit-mapped parallel devices) and intelligent modems that can distinguish between modem commands and transferred data.

It does not cover standard modulator/demodulator models or modems that have no advance capabilities beyond transmitting analog signals into digital code.

"We do not yet know for certain how many companies are affected by this patent, but we think it is at least 80. So far we have notified 38 of them and offered to negotiate a licensing agreement," Eaton commented in a recent interview.

The company is asking its competitors for a licensing fee of between .5% and 8% of net sales accruing from the use of the patented technique, and it is currently negotiating with seven of the companies reached.

The Bizcomp chief executive warned he will fight those companies that refuse to abide by the patent ruling, and he claimed his company has already set aside \$600,000 in legal fees to pursue his claims over the next few years.

"We believe that over the next three years, this patent will bring in between \$6 and \$16 million in additional revenue," Eaton said.

The Bizcomp strategy, Eaton said, is to line up licensing agreements with major modem manufacturers in a bid to convince other vendors to do likewise.

The company's view is that with the market for modems currently flourishing, most users and vendors will choose to pay up rather than get embroiled in a legal tangle that could damage customer confidence, according to Eaton.

Eaton, marks the culmination of a five-year effort to take advantage of the rapidly growing intelligent modem market.

Eaton first began his project to develop a command-driven modem while at Stanford University, where he was studying for a doctorate degree in electrical engineering.

In 1979, Eaton invented his first direct-connect modem incorporating a microprocessor with an instruction set that allowed for automatic dialing, command control over setting up the operating parameters, including both pulse and tone dialing, and a self-testing capability.

That same year Eaton set up Bizcomp to market the product, and in early 1980, he shipped his first prod-

uct and applied for a patent.

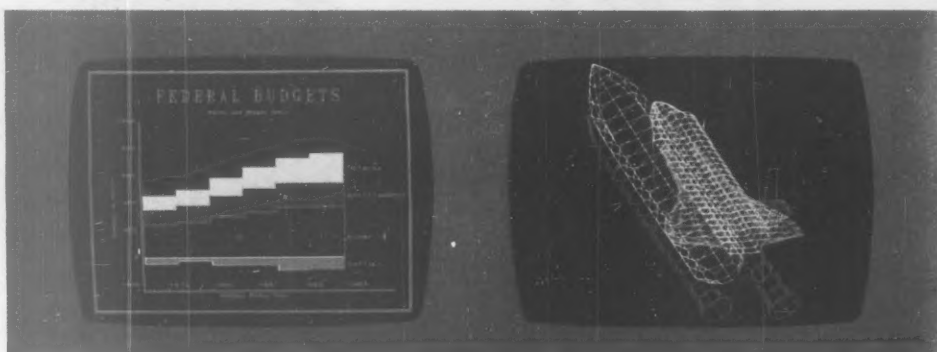
"It seemed at the time that this modem would fill a much-needed gap in the market, but we had no idea how big that market would become," Eaton commented in a recent interview. Some industry experts believe the patent applies to a large percentage of modems now being installed or shipped.

Getting the patent approved by the U.S. Patent & Trademark Office in Washington, D.C., however, proved no easy task. Eaton said the bureaucrats in the nation's capital decided that his reputed invention was a suitable candidate for its Quality Control Program — a random in-depth look at certain products to ensure that the patenting process is

working correctly. This procedure, according to Bruce Miller, Bizcomp's marketing manager, delayed approval by at least a year. "However, we feel the extra care which the Patent Office took in verifying our claim should deter competitors from challenging the patent," he added.

It was not until June of this year that Eaton finally got the legal go-ahead to claim the invention as his own. For the Sunnyvale, Calif.-based firm, the decision now opens many doors.

Bizcomp sees its hard-won patent as a way to inject much-needed cash into the company and allow it to expand its present line of 1,200 bit/sec intelligent modems with integrated voice capability.



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## IECC Addresses Pollution Issues

SAN JOSE, Calif. — In response to the discovery over the past two years of at least 50 chemical spills in Santa Clara County, five computer industry and area business organizations joined together in January 1982 to form the Industry Environmental Coordinating Committee (IECC) here.

Member organizations include the American Electronics Association (AEA), the Semiconductor Industry Association, the Santa Clara County Manufacturing Group, the Electronics Association of California and the Peninsula Industry and Business Association.

The purpose of the IECC is to "address [pollution and regula-

tion] issues in a positive, proactive manner," according to Alan Foster, a spokesman for the AEA and an IECC member.

One of the committee's first efforts involved working with local and state personnel over a 12-month period helping to shape the regulation of hazardous chemical storage under what has been called the Santa Clara County Model Ordinance, Foster said.

Among the groups involved in that project were the Silicon Valley Toxics Coalition (SVTC), comprised of local home owners, environmentalists and union activists (see related story); the Regional Water Control Board; the Santa Clara County Fire Chiefs Associa-

tion; and the state Department of Health Services, he added. The ordinance has since been passed, in part, by 11 of the 15 municipalities in the county.

Foster said the group was formed after it became apparent that the same industry people kept showing up at meetings concerning the ordinance. "It became obvious that there was some duplication of effort and that we were all working together on local issues affecting Santa Clara County," he said. Foster noted that despite the SVTC's contention that some 90 leaks emanating from underground chemical storage tanks have been found, the leaks are of varying degrees.

## EPA Chooses Calif. County For Study On Pollution

By Patricia Keefe  
CW Staff

SAN JOSE, Calif. — What was once known as the agricultural "Valley of Heart's Delight" is in danger of becoming the Silicon Valley of Contamination, according to some Santa Clara County environmentalists. As if to underline those fears, the Environmental Protection Agency (EPA) has chosen Santa Clara County as the site for a \$500,000 pollution study.

Although an EPA spokesman denied any connection between the study and pollution problems in the county, the chairman of the Silicon Valley Toxics Coalition said he found that hard to believe. "Over 90 chemical leaks — primarily emanating from high-tech companies — have been confirmed in the area over the past two years," charged coalition chairman and attorney Theodore G. Smith. Moreover, industrial air pollution and storage of highly volatile gases present other hazards that county environmentalists are attempting to monitor and alleviate, he said.

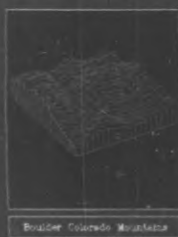
The EPA, however, insists the study is simply part of a pilot program also under way in Baltimore and Philadelphia. Building on existing environmental studies in the county, the EPA project will integrate data involving air, water and land to demonstrate how the polluting and subsequent cleanup of one medium affects the others, the spokesman claimed. It is said to be an attempt to "move beyond traditional single-purpose approaches to environmental management." The spokesman was unable to provide any specifics of the planned study.

He added, however, that one reason the county, also the home of Silicon Valley, was chosen was the "high quality of state and local environmental experts [located there]."

### Reverse Unpopular Image

Smith suggests another motive: In an attempt to reverse an unpopular image acquired in the last few years, the EPA thinks that by "sprinkling money in here, they can claim they helped solve our problems." Regardless of the EPA's reasoning, Smith said his group is willing to work with the federal agency on the study — once it figures out what the EPA plans on doing, that is. The Silicon Valley Toxics Coalition is a group of environmental activists and labor unions seeking to limit the use of toxic chemicals in the workplace. The coalition was formed as one response to the discovery of over 50 tanks leaking hazardous chemicals into drinking water supplies, including 1,1,1-trichloroethane (TCA), a solvent used to clean silicon chips. TCA is linked to a number of health problems and was found to cause cancer in laboratory mice in a study released earlier this year by the National Toxicology Program.

In late 1981, trichlorethylene (TCE) and TCA were found to have leaked (Continued on Page 141)



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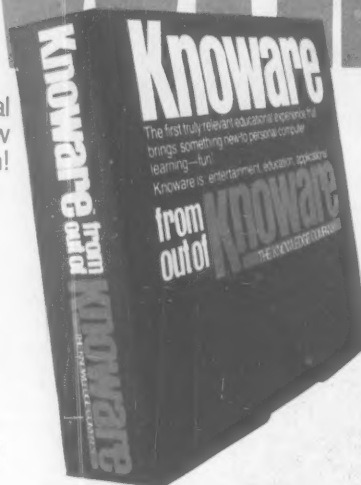
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## Japan Still Has Long Way to Go U.S. Lead in DP Market Seen Not Threatened

WASHINGTON, D.C. — U.S. computer makers are so entrenched in world markets that there is no reason to believe they are seriously threatened by foreign competition, congressional researchers recently reported.

"There are few concrete signs that this dominance by U.S.-based firms is threatened," the Office of Technology Assessment (OTA) said in a 563-page report on U.S. international competitiveness in electronics.

"Relative positions within the world computer industry will continue to shift, stimulated in many cases by new applications of computing power," the OTA said. It added that "as the industry continues to evolve, the technological leads of American firms are likely to shrink, and competitive positions may become more difficult to maintain."

"Nevertheless," the study continued, "The U.S. lead in worldwide marketing of data processing systems is so large that prospective challenges such as Japan cannot hope for more than modest success over the rest of the century."

Discussing the reasons for U.S. strength in this sector, the OTA report suggested that "American firms have done a much better job than their foreign competitors of balancing what the available technology can do against what customers for data processing systems have wanted to accomplish."

### Foreign Vendors

The OTA elaborated on that point by noting that although foreign firms have sometimes been able to match U.S. hardware, foreign vendors have not been as adept at producing software and developing new applications as have U.S. firms.

The study cautioned, however, that with the development of new applications, such as desktop computing and office automation, foreign firms may gain greater market share than they have captured in mainframe computer systems.

### Turning to Japan

Turning to Japan, the most vigorous competitor, the study said that even that

country will continue to lag behind American companies. The OTA noted, for example, that even with concerted government-sponsored research and development efforts, Japan, though committed to surpassing U.S. industry, still has a long way to go.

The study remarked that "the leading Japanese exporter of computers, by a large margin, is IBM-Japan — despite the fact that it has been barred from many of the government programs

that have aided other [Japanese] computer manufacturers."

"While IBM has abundant resources and technology to compete effectively against Japanese computer firms, other American manufacturers may face increasing difficulty in the future," the OTA added. The report suggested that "although the U.S. industry is not immediately imperiled, the federal government could help ensure future competitiveness through better developed,

more consistent industrial policy, particularly one supporting technology development and technical education."

On the subject of industrial policy, the report stated that such policy action cannot offer "any sure prescriptions that can guarantee the future competitiveness of our microelectronics or computer sectors." But, the OTA said, "a 'business-as-usual' approach is unlikely to prove sufficient to maintaining U.S. competitiveness."

## EPA Chooses Calif. County For Study

(Continued from Page 139)

from underground storage tanks owned by Intel Corp. and Fairchild Camera and Instrument Corp., respectively, allegedly contaminating some water supplies in the valley [CW, Feb. 22, 1982]. However, a follow-up investigation completed in June 1982 found only sporadic incidents of chemical contamination, according to county water officials [CW, June 28, 1982].

The coalition has assisted in the development of a model ordinance that requires permits for storing hazardous chemicals and makes installation of double-walled storage tanks mandatory.

Underground storage of toxic chemicals reportedly was called a "significant source of contamination" in a report released in April 1982 by the State Assembly Office of Research. Moreover, Smith contends it constitutes "a terrible fire and explosive hazard with the potential for catastrophic problems."

The ordinance has been adopted in part by 11 of the 15 municipalities in Santa Clara County.

## Wang Plans To Buy 15% OF VLSI

LOWELL, Mass. — Wang Laboratories, Inc. last week announced its intention to buy 15% of VLSI Technology, Inc., a custom integrated circuit maker based in San Jose, Calif.

The minority equity purchase would cost Wang about \$34 million and would make Wang VLSI's largest shareholder. At present, Wang is one of the firm's biggest customers for custom-designed chips. Last year Wang scuttled plans to produce its own chips.

Wang's move to buy a piece of a custom chip maker follows similar minority purchases made by other major systems makers in the past year. IBM in 1982 bought a major stake in Intel Corp., which supplies IBM with much of the processing circuitry for IBM's Personal Computer lines, and both Sperry Corp. and Digital Equipment Corp. this year purchased a minority stake in Trilogy Ltd., which hopes to market its new wafer design for large mainframes.

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# CWA Chief: High-Tech Unionization Is Coming

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — Communications Workers of America's (CWA) President Glenn Watts recently predicted a wave of unionization in high-technology industries, which today are mostly nonunion.

Addressing a Nov. 18 meeting sponsored by the Information Industry Association, Watts offered the recent contract agreement between CWA and AT&T and the Bell operating companies as a model for future labor-management relations. That

agreement, he said, is characterized by job training and retraining programs for workers displaced by technology, income protection arrangements for workers if personnel levels are cut and new, extensive management-worker cooperation plans.

Noting that change is a constant in a high-tech society, Watts called management-labor cooperation "a powerful tool" and said "those companies that practice worker participation will come out the winners." He called for a federal industrial policy that includes "consensus building" among all levels of the economy to ensure continued U.S. competitiveness in world markets.

Pointing to the convergence of telecommunications and computer

technologies and industries, Watts said one major remaining difference between the two sectors is that while "the telecommunications industry is substantially organized... the manufacturing of all this new equipment is a mixed bag and is not substantially organized."

"There is a new wave of organizing that has not come about yet," he said, predicting, "we will see a substantial amount of organization in this area."

High-technology industries, such as computer manufacturers, in their early stages have been characterized by entrepreneurial management and highly trained, highly motivated technical personnel, Watts commented. He added that has changed and

workers are seeing they have the same needs for union protection that workers in older industries found.

The question is not whether these new industries will organize, but who will do it, according to Watts. "If the unions are not successful," he said, "the workers, out of self-interest, will organize themselves."

Asked if he sees the CWA becoming more active in attempting to organize other high-technology sectors, Watts noted that his union has organized a number of noncommunications entities. "If you talk, you communicate," he said, indicating that the CWA considers any worker unit a fair target for CWA membership. "We'll organize anything that moves," Watts said.

## Copyright Bill For Semi Designs Gets GOP Boost

By Robert Batt

CW West Coast Bureau

WASHINGTON, D.C. — The efforts of semiconductor manufacturers to obtain copyright protection for chip designs have received a major boost from the Republican Task Force on High-Technology Initiatives.

The newly created 140-member Task Force, spearheaded by California Rep. Ed Zschau, has decided to support the Semiconductor Chip Protection Act — H.R. 1028 — which would prevent unauthorized copying of semiconductor circuit pattern designs and supposedly protect U.S. firms from the losses they now suffer as a result of pirate competition.

Currently, no form of intellectual property law includes semiconductor designs, and a successful design, which may cost the originator up to \$100 million to produce, can, according to advocates of legislation, be copied by a competitor through simple photographic reproduction for as little as \$50,000.

The support of the Republican caucus is seen on Capitol Hill as critical to the eventual passage of legislation in the House of Representatives. Up until this time, the impetus for passing H.R. 1028 has come mostly from Democratic members of the House. The intervention of the GOP legislators is seen as a move likely to ensure the success of the bill.

According to the Semiconductor Industry Association (SIA), which represents the majority of large U.S. chip manufacturers, the threat of piracy dramatically reduces the incentive for companies to make the research and development investments that new products require.

Passage of H.R. 1028, which is co-sponsored by 20 congressmen, or its companion bill in the Senate — S. 1201 — would amend Title 17 of the U.S. Copyright Act to include semiconductor masks — the materials containing the designs that allow devices to operate in a particular manner.

While specifically prohibiting the unauthorized copying of semiconductor mask designs, proponents of the legislation said the bills would protect the right of competitors to "reverse engineer" through studying chip designs and then producing chips that might have the same function but are of different design.

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# Software Deals Seen Leading Acquisitions Rush

(Continued from Page 135)

targets for sale.

According to Thomas Lawton, editor of the Belmont, Mass.-based *Computer Services Report*, privately held Cincom Systems, Inc., maker of the Total DBMS, has no intention either of going public or being acquired. The same holds true of publicly held Cullinet Software, Inc. and Software AG, he said.

"This is why CCA sold so high," Lawton said of its \$40 million sale price paid by a Canadian insurance company's subsidiary.

With slim acquisition pickings in the DBMS area, who are the other hot acquisition candidates, and who are the hungriest buyers?

Analysts point out that several of

the bigger service companies, such as Electronic Data Systems Corp. and Computer Sciences Corp., have been actively acquiring small (\$1 million to \$5 million) service companies in specific geographic areas to broaden market penetration.

"It's a quick — and if done right — effective way for the service firms

to build market share," said Ann Morley, acquisitions watcher at International Data Corp. in Framingham, Mass.

Lawton cited Anacom, Inc. as one troubled service company likely to seek an acquisition partner. After turning a profit for several consecutive years, Anacom lost nearly \$4

million on record sales of \$172 million in fiscal 1983, posting an even greater loss of \$12 million in the first quarter ended Sept. 30. Sales, too, plunged 25% to \$36 million.

"They don't have the cash to continue much longer," Lawton said. "They'll either have to split up the company or be acquired."

## Mergers Tied to Rising Capital Need

(Continued from Page 135)

good small companies and the difficulty for even large companies to build a product from the ground up, acquisition activity is very high."

Statistics bear out the accuracy of Morley's observations. In the first six

months of 1983, Broadview Associates, a Fort Lee, N.J., merger consulting firm, logged 61 acquisitions of software and service firms totaling more than \$400 million. This is an amount equal to all the acquisition activity in 1982.

Broadview estimates further that more than \$1 billion will be spent acquiring software and service companies in 1983, with the greatest activity coming traditionally at year's end. IDC predicts that acquisitions of software and service firms will top 150 this year, with a continuation of acquisition growth into 1984.

Moreover, a projected 35% compounded annual growth rate in software and services revenues is attracting a number of non-high-tech, diversified firms to the acquisition arena. These diversified, non-high-tech buyers tend to leave the acquired company's management to its own devices after paying the purchase price, an arrangement that makes these buyers attractive "marriage partners," according to one acquisitions analyst.

Why the heightened interest in the buying and selling of software and service companies, including the purchase and sale this year of several industry notables.


### 'Dual Skills Requirement'

Regarding software companies, one reason can be found in the "dual skills requirement" of successfully developing and marketing a main-frame package, according to Gilbert Mintz, who founded Broadview Associates 10 years ago. Mintz said that today's markets are characterized by a high degree of specialization and "niche orientation." Penetrating new software markets requires the technical skills to write and install packages as well as the business, marketing and entrepreneurial skills to sell the packages in particular horizontal markets.

"You need big bucks to play both games if you're trying to expand into new areas today," Mintz said. "Acquisition is the fastest, safest and surest way of penetrating new markets." Rumblings emanating from the financial community have also added to acquisition activity. Due to the declining fortunes in recent months of many high-tech stocks traded over-the-counter, investors have begun "backing off from many new issues of high-tech companies going public," said Thomas Lawton, publisher of the *Computer Services Report* in Belmont, Mass.

As a result, going public is becoming a less viable course for raising sorely needed capital, and acquisition is a correspondingly more attractive route, Lawton said.

The undeniable need to raise hefty sums of capital for research, development and marketing was cited as the chief reason for seeking an acquisition partner by the presidents of both McCormack & Dodge Corp. [CW, March 28] and Mathematica Products, Inc. [CW, Aug. 8].



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## Acquisition a Viable Route to Corporate Growth

By Bill Laberis  
CW Staff

As competition in the computer services industry has heated up in recent years, several leading companies have incorporated aggressive acquisition efforts into overall growth plans, in some cases using the acquisition route as the primary growth vehicle.

Computer Sciences Corp. (CSC), a \$700 million-plus service company based in El Segundo, Calif., is one of the more aggressive acquisition-oriented companies. In fact, CSC has for some time employed an acquisition specialist, whose function is to seek out and buy smaller companies to fit into the company fold.

Steve Elias, CSC's corporate director of acquisition, termed the company's acquisition posture "a prime corporate direction," highlighted by Elias' reporting directly to the chairman of the board. For the right acquisition, Elias said, CSC will provide him with "whatever it takes . . . to acquire a company we want," adding that all acquisitions to date have been made with cash.

A year ago, CSC paid \$20 million for Houston-based Associated Credit Services (ACS), which itself was the size of many other service companies, grossing about \$27 million. Elias said CSC has allowed ACS to retain "just about as much" autonomy as it enjoyed before acquisition, with

the exception that ACS' private telecommunications network has been replaced by CSC's Infonet.

However, CSC is not bound by set rules regarding the autonomy the company will grant the management of companies acquired, Elias said. Acquisitions made in the medical claims processing area, for example, are fully integrated into CSC's claims operations. But in general, it is CSC's "absolute desire . . . to retain management of companies" they buy.

Asked if he looks over his shoulder at the acquisitions of CSC's staunchest competitor, Electronic Data Systems Corp., Elias said the two companies often seek different acquisition candidates. "I don't see a great deal of competition in the [ac-

quisition] marketplace," he said. "I try to look ahead, not over my shoulder."

### Completed Third Acquisition

Buffalo, N.Y.-based Computer Task Group, Inc. (CTG) has similarly been active in the acquisition arena, using its acquisitions both to penetrate new markets and to deepen its coverage in selected geographic areas. Earlier this month, the \$50 million-per-year service company completed its third acquisition of the year, buying Data Structures, Inc., a professional service firm in New York.

With its latest purchase, CTG will have added 110 people to its 1,200-person work force, less than half the

number of employees added via internal growth, according to John P. Courtney, executive vice-president.

Courtney said the acquisition process at CTG is carried out in steps "and is active as opposed to reactive, as much as we can make it."

Initially the company targets a geographic area it wishes to penetrate or expand into, then dispatches an acquisition specialist to survey acquisition candidates in that area. First, contact is made by mail, followed by personal contacts before the dickering process begins. Courtney said that the pickings are slim in many areas. "Most companies for sale are not really the best, and the ones that are good are often pretty expensive."

## Show Sponsors Break Ground On Exhibit Hall

SAN MATEO, Calif. — Producers of the Semicon/West trade show recently broke ground on a privately funded exhibit hall that will be turned over to county officials after 10 years.

The Semiconductor Equipment and Materials Institute (Semi), sponsor of the Semicon/West trade show held annually at the San Mateo County Fairgrounds, funded the \$1.5 million hall under agreement with the San Mateo County Board of Supervisors.

Semi will recoup its investment by using the hall rent-free during Semicon/West shows and receiving other revenues generated by the hall. After the investment is paid off over an estimated 10-year period, the hall will become the property of the county, a Semi spokesman said.

The 100,000-sq ft building will provide space for more than 500 exhibits, increasing the number of exhibit spaces at the fairgrounds and at a nearby complex to 1,700, according to the Semi spokesman. Last year, nearly 700 exhibitors attended the show, while another 100 exhibitors were turned away for lack of space, according to the spokesman.

According to James C. Morgan, president of Semi and president of the Santa Clara, Calif.-based Applied Materials, Inc., "The project is believed to be the first time a show producer has made a commitment to build an exhibit hall." No public funds will be used in construction, he added.

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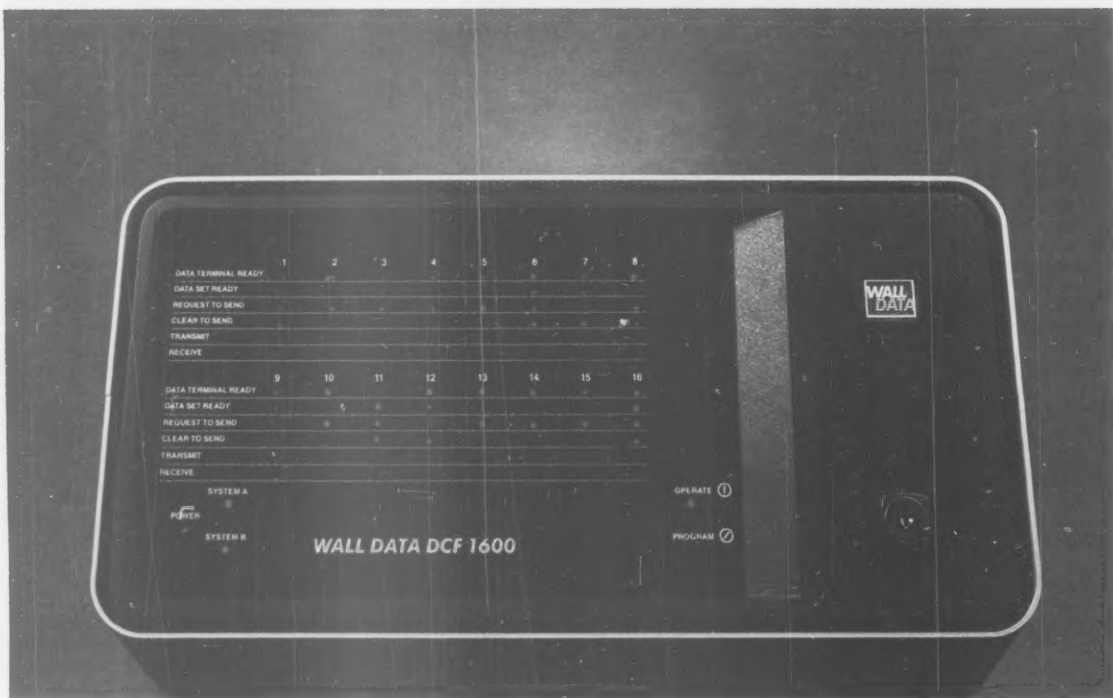
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And System/34 and /38 installations can use the DCF Series to support ASCII terminals and printers as 525X SDLC devices.

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In fact, the exclusive "concurrency" feature of the DCF Series permits up to six protocol conversions to run to six separate hosts at the same time. No other communications controller in its class offers this flexibility.

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## Executive Corner

• **William E. Blasdel** has been named vice-president of systems programs at Calma Co.

• **Frank R. Jerd** has been named vice-president of sales at Telex Computer Products, Inc.

• **Joseph J. Porfeli** has been named vice-president and general manager of GTE Telenet Communications Corp.'s Network Applications and Terminals business units.

• **Thomas S. McCaffrey** has been named vice-president, worldwide marketing, in the Computer Systems

operations of Sperry Corp.

• **Guy H.B. Shaffer** has been named director, information processing systems, at RCA Government Communications Systems.

• **Stanley W. DeVaughn** has been appointed vice-president, communications, at Xebec.

• **Jamy Faulhaber** has joined Lecht Sciences, Inc. as president, replacing founder Charles P. Lecht, who will continue as chairman and chief executive officer of the company.

• **William Minchin** has been appointed vice-president of manufacturing at Auragen Systems Corp.

• **Richard V. Paulson** has been named a vice-president and general manager, development, of Compu-tivation Corp.

• **William G. Stapp** has been promoted to vice-president of data processing for Hogan Systems, Inc.

• **James F. Ferenz** has been appointed vice-president of manufacturing at Fortune Systems Corp.

• **Roy J. Moffa**, former program

manager for Digital Equipment Corp.'s 32-bit micro VAX computers, has joined Pixel Computer, Inc. as president and chief executive officer.

• **Dr. Phillips W. Smith** has been appointed president, chief executive officer and a member of the board of directors of CAE Systems, Inc.

• **Zoran Simic** has been appointed vice-president of manufacturing at Tymshare, Inc.

• **Roger Norris** has been promoted to vice-president, sales, for Lee Data Corp.

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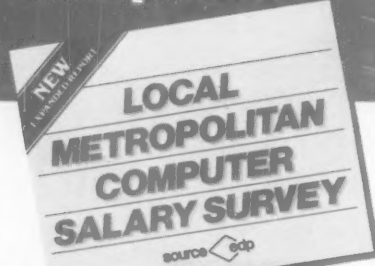
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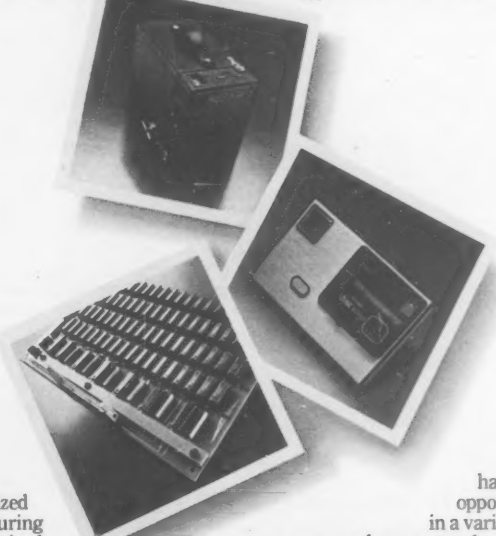
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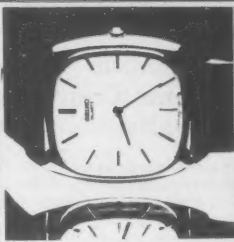
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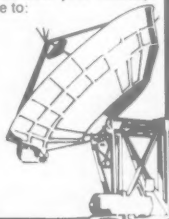
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OUR CLIENTS are the leading NATIONAL and INTERNATIONAL corporations with major DATA PROCESSING CENTERS in NC, SC, So. VA., No. GA. They offer "state of the art" Technology, excellent WORKING CONDITIONS, outstanding FRINGE BENEFITS and nationally COMPETITIVE SALARIES. Many positions are eligible for equity home purchases and closing cost reimbursement. THE SOUTHEASTERN METRO AREAS — which we serve — are characterized by: A REASONABLE COST OF LIVING — at or below the national average; AFFORDABLE HOUSING — below the national average; AN ENJOYABLE MODE OF LIFE — population density is sufficient to support excellent shopping facilities, cultural and recreational opportunities and quality educational systems without the congestion, pollution and crime you may be experiencing; OUTSTANDING CAREER OPPORTUNITIES — recognizing the attractiveness of living in the Southeast, a growing number of Major Corporations relocate their data centers to this area each year; AN AGREEABLE CLIMATE — four very definite seasons each year with long pleasant Springs (March-June) and Falls (Sept.-Dec.) with short summers and winters, although we see snow every winter, it doesn't last long. And best of all THE NATIVES ARE FRIENDLY.

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**CAPACITY PLANNER** to \$45K  
Min. 2 yrs. Capacity Planning exp. in large mainframe IBM multi CPU's; MVS/IMS/CICS environment. Applications Requirements Planning.  
**SR. SYSTEMS PROGRAMMER** to \$40K  
Min. 4 yrs. Operating Systems generation, maintenance and tuning with min. 2 yrs. VM.  
**SR. SYSTEMS PROGRAMMER** to \$40K  
Min. 4 yrs. Systems generation with min. 2 yrs. MVS Performance monitoring & tuning.  
**SR. SYSTEMS PROGRAMMER** to \$40K  
Min. 4 yrs. Software Support with min. 2 yrs. SNA, IBM J705, NCP, ACF/VTAM.  
**SR. SYSTEMS PROGRAMMER** to \$40K  
Min. 2 yrs. Exp. in the generation, maintenance & tuning of RSC/11M4, DECNET a plus.  
**SR. SYSTEMS PROGRAMMER** to \$40K  
Min. 3 yrs. IBM host based Distributed Systems with Min. 1 yr. in the generation, maintenance & tuning of DPF/Operating System.

**APPLICATIONS**  
**SR. SYSTEMS ANALYST** to \$40K  
Min. 2 yrs. exp. in the analysis and design of shared logic OFFICE AUTOMATION SYSTEMS. Exp. with IBM 8100's, DISPLAYWRITER, P.C.'s, Electronic Mail and/or Communications are a plus.

**SYSTEMS ANALYST** to \$35K  
Min. 4 yrs. exp. in the analysis & design of data processing systems with project involvement, user interface, analytical ability & verbal & written communications skills. Capability of understanding, evaluating & solving equipment problems in the OFFICE AUTOMATION AREA.

**ANALYST PROGRAMMER** to \$36K  
Min. 3 yrs. Analysis, Design Development & Programming & Implementation of business systems in a large mainframe IBM OS/MVS environment. Proficiency in COBOL, OS/MVS, JCL & IMS DB/DC required. SAS, TSO/SPF experience and a college degree a plus.

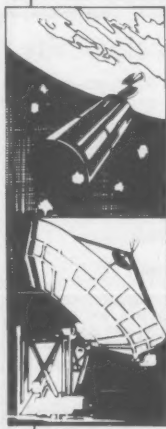
WE ARE PROFESSIONAL RECRUITERS. Our function is to identify, quantify, qualify, and refer candidates for specific positions within our company clients' organizations. We serve as a BROKER in the truest sense of the word (i.e. represent both parties with the objective of reaching an agreement which is satisfactory to both) throughout the Interview, Offer, and Acceptance Process. We only recruit for companies who have agreed in advance to assume the responsibility for our fees and your interview and relocation expenses.

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Innovative solutions to information systems problems have made Federal Express the leader in the industry in the overnight movement of high priority business goods and documents. Behind every one of our innovations is a group of talented, committed people. Presently, we are seeking a Communications Specification Planner to assist in the development/implementation of real-time transaction processing system and other hardware systems.

You will be responsible for the design of protocol interfaces for a minicomputer based processing system and the design of a peripheral network. Further responsibilities include supervising vendor maintenance, troubleshooting, and developing long range data processing/communication hardware requirements.

You'll need a Bachelor's degree or equivalent experience and four years professional DP experience with functional network design and communications system development. Mainframe and minicomputer experience needed along with good oral/written communication skills.

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SYSOREX INTERNATIONAL, a California Corporation and a rapidly growing systems management company now developing innovative multi-technology systems in Saudi Arabia has the following challenging positions:

### DP Technical Manager

BS required. MBA or advanced degree desirable. At least 15 years DP experience. Last 5 years in a mgt. position in which it was necessary to prepare and execute formal work plans and supervise a technical staff of systems programmers, database administrators, systems analysts and programmers. Programming experience on large IBM systems using COBOL/CICS/ADABAS desirable. Systems analysis and design experience desirable.

### (3) Programmer / Analysts (1) Systems Analyst

BS in Computer Science or equivalent curriculum required. At least 3 years experience programming in a OS/CICS/COBOL environment plus 4 years experience designing administrative systems such as finance, acctg, payroll or personnel. This experience should be on one of the major database systems such as ADABAS, IMS, or IDMS.

### Computer Maintenance Technician

EE degree preferred or equivalent in college, military or vocational training. Minimum of 5 years experience in minicomputer systems and peripherals. Experience on Camdex, Magnuson or Formation desired. Will handle preventive maintenance, repairs, modifications and installation of computer-systems and peripherals, modems, multiplexors, facsimiles, switch gears and UPS systems.

### Micrographics Analyst/Supervisor

BS/BA required. 6 years experience in production of 35mm aperture cards to mil specs. Must be qualified in Engineering reprographic process to "Blow-Back" aperture cards onto polyester base materials. Will instruct in-house personnel in micrographics techniques.

### Systems Programmer

BS in Computer Science or equivalent curriculum required. At least 4 years experience as a systems programmer. Specific experience should include MVS, VTAM, NCP, CICS, ASSEMBLER and COBOL. Desirable to have VM, VST and ADABAS experience.

### User Trainer - Bi-Lingual

BA required. Minimum of 3 years experience in MIS in one or more of the following areas: programming, systems analysis or computer operations. Some teaching experience in school or industry desirable. Must be fluent in Arabic (written and spoken).

### Training Specialist

BS/BA required. Minimum of 5 years experience in software engineering or systems programming. A significant amount of experience should be in DP curriculum development and training. In addition, experience in resource planning and development of marketing aid desirable. Knowledge of Arabic a plus.

### Resident Coordinator

Degree required. DP professional with 3 to 5 years programming experience on payroll/personnel systems. Experience should include 1 to 2 years supervision of data entry clerks. Bi-lingual English/Arabic required. This is a SINGLE STATUS POSITION.

### User Services Specialist

Degree required. Fluent Arabic/English - ABSOLUTELY REQUIRED. Minimum 4 years experience in programming and designing on-line systems. Knowledge of financial systems. User interface.

The functions of this DP position are: coordinator between computer systems users and programming development groups; investigate, document and follow-up on user requirements; work with program development on systems design and systems test; oversee installation of new systems; study with the user, system enhancements, and make recommendations to programming development group.

### Project Planner

BS in Computer Science or related field. Minimum of 5 years experience involving project planning, scheduling, customer relations and management of computer operations or systems and programming groups. Must be familiar with CPM scheduling methods, project organization, presentation and training techniques. Must have demonstrated ability to work with senior management.

Responsibilities: develop and maintain detailed project schedules including computerized CPM schedules, distribute and explain project plans and schedules to project personnel, brief project manager on project status, and will assist project manager with liaison duties and client relations.

We offer an excellent benefit package including: medical, life, accidental death, disability and profit sharing plans. You will additionally receive 25 working days vacation, 15 holidays, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present Federal Income Tax exclusions.

Please send resume INDICATING POSITION TITLE FOR WHICH YOU ARE APPLYING with present salary to Personnel, 100-CW, SYSOREX INTERNATIONAL, INC., 10590 N. Tantau Avenue, Cupertino, CA 95014. U.S. CITIZENSHIP REQUIRED. INDIVIDUALS ONLY APPLY.

**SYSOREX**

Sysorex International Inc.



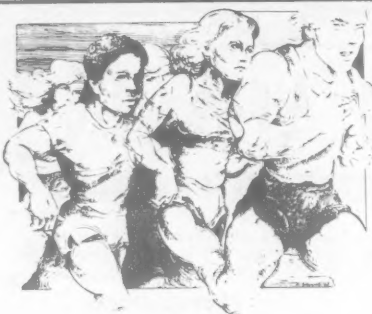
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## IS YOUR CAREER IN STRIDE?

Whether you're an Olympic runner or a dedicated DP specialist, it pays to approach your career as a professional.

In every sport, industry or pursuit, the best and the brightest train tough, listen to the experts and are committed to go the distance for excellence.

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## SYSTEMS PROGRAMMER Information Services

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In providing technical support to our Data Processing operations, your responsibilities will encompass general systems software, matching computer hardware and software to Company needs, coordinating data communications and assisting Systems and Programming and Operations staff to optimally utilize systems resources.

Your three years experience as a MVS Systems Programmer coupled with at least one year in support of Mini-computer Systems are key qualifications for this position; BSCS preferred. An understanding of Multi-vendors in support of your activities is essential.



We offer outstanding salaries and benefits. Qualified candidates please send resume with salary history, to Isaac Dixon, Personnel Analyst, PACIFIC TELECOM, P.O. Box 9901, Vancouver WA 98668-9901. Equal opportunity employer.

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Needed in a dynamic, fast paced, large scale, multi-manifesto shop.

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**PROGRAMMER/ANALYST** to analyze & refine data and correct to programmable form using COBOL, RPG, DX10. Provide design support. Prepare technical programmer level documentation. Work with TI990/10 & OMR Scantron. 1 yr minimum exp. \$470/wk. Send resume to R.V. Weatherford Co., 6921 San Fernando Rd., Glendale, CA 91201.

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Positions now open include: Programmers, Systems Analysts, Quality Assurance Analysts, Customer Support Representatives.

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## Robotics Instructor

Instructor wanted for new 2 year program in robotics/flexible automation technician at Minneapolis Technical Institute in a 46 week per year position. Classes scheduled 3:15 to 10:00. Minnesota Vocational licensure requirements of 2000 hours occupational experience in robotics plus 4000 hours either/or electronics, mechanics, manufacturing processes, robotics, and electro-mechanical. For further information call Joe Zetah (612) 370-9478.

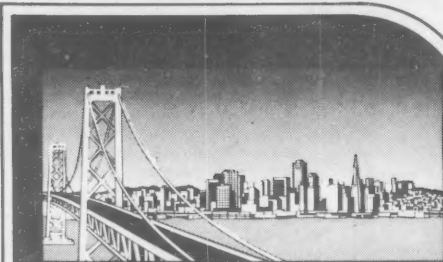


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Bank of America is seeking Product Consultants and Systems Analysts who will provide support for our Business Services. These individuals will be responsible for the development and implementation of an online Human Resources Management System.

You must have detailed knowledge of Benefits Administration products with emphasis in insurance, investments, salary and special compensation. You must have excellent oral and written communication skills, and have had development experience with Interactive Benefit Administration Systems. Four or more years in the following skills: D-Basic, PASCAL and/or PL1, PICK operating system is a plus.

Bank of America offers excellent benefits package and salary commensurate with experience. Please send your resume and salary history to: Michael Strong, Bank of America, Management Recruitment Dept. 3442-1128A, P.O. Box 37000, San Francisco, CA 94137. An equal opportunity employer, m/f/h/v.



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Worldwide Field Engineering Division is looking for hard working individuals AT ALL LEVELS, experienced in:

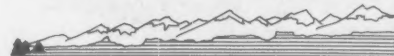
- CICS COMMAND LEVEL COBOL
- Application Database
- On-line Systems Development

Successful candidates should have a minimum of 2 years experience in on-line CICS command level COBOL and 1 year of Database exposure. (IDMS experience is a plus) Specific responsibilities include the development and maintenance of application software utilized worldwide by Storage Technology's outstanding field force.

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**Storage Technology**



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Qualified candidates should possess 3-5 years of directly related experience in the data processing field and a proven background in one or more of the following technical areas:

<b>PL/1</b>	<b>Model 204</b>	<b>CULPRIT</b>
<b>COBOL</b>	<b>IMS</b>	<b>ADSO</b>
<b>Assembler</b>	<b>IMS DB/DC</b>	<b>FOCUS</b>
<b>DIBOL</b>	<b>CICS(Command or Macro)</b>	

Application areas of particular interest include: MANUFACTURING, UTILITIES, SCIENTIFIC and BANKING (international banking of special interest). DATA BASE ADMINISTRATORS, PROJECT LEADERS, SYSTEMS ANALYST and PROGRAMMER ANALYST are needed to fill current requirements. We offer a highly attractive salary commensurate with experience and a fully comprehensive fringe benefit program including paid overtime. Call or submit your resume with SALARY HISTORY in strictest confidence to:

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We serve a 4.8 billion dollar bank holding company... we know we need a top flight professional. Our compensation and benefit programs will support that need.

If you are interested in Texas American Services, Inc., and have managed computer operations for a large bank—OS/MVS—send your resume and salary history, in complete confidence to:

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Fort Worth, Texas 76113  
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AMERICAN  
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American Airlines

## CAREER OPPORTUNITIES

To maintain our position as a LEADER in the airline industry requires the best DATA PROCESSING PROFESSIONALS available. We have the following immediate and future openings at the designated locations.

### PARS/ACP Programmer Analysts

Position requires one or more years programming experience in a PARS/ACP environment, a good working knowledge of assembler language and airline control/PARS concepts. A working knowledge of SABRETALK is desired. Responsibilities include problem analysis, program specifications, coding and testing of SABRE application software supporting marketing and flight systems.

Degree preferred, Openings exist in Tulsa and Dallas.

### IMS Programmer Analysts

Position requires one or more years of IMS applications development experience using structural methodologies preferably Yourdon. Responsibilities include problem analysis, development of program specifications, coding, testing, and documentation preparation. A good working knowledge of IMS, PLI and JCL required.

Degree preferred. Openings exist in Tulsa and Dallas.

### Data Base Analysts/Support

Position requires three years program and design experience and minimum of one year DBA physical/logical design experience. A degree is preferred as well as experience in TSO/SPF and IMS utilities.

Openings in Tulsa.

### ACPT/TPF Systems Programmers

Position requires three or more years experience in ACP/TPF operating systems internals and indepth knowledge of assembler language, VM/CMS required. Responsibilities involve development of state of the art ACP/TPF enhancements, Applications Development tools, and Data Base Support utilities. Provides support to a multi-processor, ACP environment.

Openings exist in Tulsa.

### VM Performance Analyst/Capacity Planning

Position requires two years experience in VM software or VM performance management, and working knowledge of VM/370 system software. Good written and oral communication skills, and a degree are desired. Responsibilities involve the analyzing, monitoring and establishing the workload guidelines for VM processor complex.

Openings exist in Tulsa.

### Engineers, Communication Systems

Openings exist in two areas. The respective qualifications are:

One year minimum experience in Process Control with a knowledge of Forth, and two years experience with minicomputer hardware and assembler language required. Knowledge of DEC and CAI preferred. Positions involve engineering airline automated baggage systems.

Three years experience with Communications Network Design. Knowledge of Asynchronous, Synchronous, Protocols and SNA/SDLC required. Positions involve engineering new communications systems including design testing and implementation.

Both positions require two years technical writing experience including functional specs, acceptance tests and evaluation reports. Degree in field of Data Processing or Telecommunications desired.

Positions are located in Tulsa.

### Telecommunications-Tech Controller

Experience with medium and high speed data circuits and related equipment supporting a large on-line telecommunications system is required. Successful candidates will work with all types of analog and digital test equipment including the latest automated test facilities utilizing micro processor equipped modems supporting a large on-line data communications system.

Openings exist in Hartford. Anticipated openings in Tulsa, Los Angeles, and Cincinnati.

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#### Small Systems

The selected individual will conduct market research and analysis relative to the personal computer marketplace. Major responsibilities include assisting and generating the publication of new product proposals, business proposals, and marketing plans. Other duties include assisting in product test marketing, seminars, and demonstrations, as well as the development and maintenance of long range strategic planning.

#### Database Management

You should have broad experience in installation support and/or technical evaluations of mid to high range DBMS products, inquiry languages, report writers and related user productivity tools. Familiarity with Datapoint hardware and software products and product planning and/or program management experience is desirable. Good presentation skills essential.

Both positions require a degree in Computer Science or Business (or equivalent preference) and at least 6 years experience in marketing development/support in the computer industry. DATAPOINT offers an excellent salary and complete benefits. For immediate consideration, please send your resume with salary history to: Nancy Ragle, Datapoint Corporation, 9725 Datapoint Dr., MS G-05-301, San Antonio, Texas 78284. We are an equal opportunity employer m/f/h.



### ADVANCED TECHNOLOGY Offering Career Opportunities to SENIOR SYSTEMS PROFESSIONALS

Professional services is a young, growing industry, an industry that is now established as a major source of expertise in a world where knowledge and information have become increasingly prized. Advanced Technology is a leader in this growth industry. Created in 1976, our company has grown side by side with the increasing demand for professional expertise and management. As we transform our phenomenal growth into impressive corporate stability, we seek SENIOR SYSTEMS and DATA BASE PROFESSIONALS.

Our preferred qualifications are a master's degree (Computer Science or related field), 10-12 years experience in data base design, analysis, and administration along with strong research, management, programming, and consulting skills. In-depth experience with a major data base management system such as ADABAS or IMS, COBOL, JCL and VSAM on large IBM systems are required.

Advanced Technology offers truly challenging careers to qualified professionals. To apply, send your resume and salary requirements in strict confidence to: PATTI MILLER.

ADVANCED TECHNOLOGY, INC.  
Dept. MP-27  
7923 Jones Branch Drive  
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Harrah's Hotel & Casino in Atlantic City is now recruiting for a Senior EDP Auditor. Qualified candidates are required to have a college degree in Accounting, Business or Computer Science or equivalent experience with at least 2 years audit experience in a CPA firm or a structured internal audit department. Two (2) years data processing or data processing audit experience also required. Candidate must have a firm understanding of audit techniques and the application development process in order to perform control reviews of systems under development and existing operational systems. Other responsibilities will include performing general controls reviews of data control & providing technical assistance to other auditors. Send resume and salary requirements to:

HARRAH'S  
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Attn: Carol Schmeiz

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JOB ORDER NO. 2046305

Research in the field of numerical ocean modeling involving production of software for the numerical solution of finite difference Helmholtz's equation over non-rectangular two dimensional regions in FORTRAN for CYBER 200 Series Vector Supercomputers. Expertise in the numerical solution of finite difference Helmholtz's equation over non-rectangular regions. Also proficiency in using standard FORTRAN to produce efficient code on CYBER 200 Series Vector Supercomputer. Must have Ph.D. with Major in Numerical Analysis. 40 hrs/week, \$35,000/year. CONTACT: MISSISSIPPI DEPT. OF LABOR, 207 East Canal Street, P.O. Box 430, Piquette, Miss., 39466

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Due to expansion, a major apparel manufacturing company has openings for two Data Processing Professionals.

**Systems Analyst** - Minimum of 5 years designing manufacturing, financial and administrative systems. Degree preferred but not required. Experience with the following desirable - Project Leading, COBOL, CICS, VSE, Data Base and Apparel Systems.

**Programmer Analyst** - Minimum of 2 years experience as a programmer Analyst, with required experience in CICS, COBOL, Manufacturing, Financial and Sales Administrative Systems. Experience with the following desirable - VSE, Apparel Systems and Data Base. Salary Open. Please submit resume with experience and salary requirements to:

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Thomson Company  
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Thomson, Georgia 30824

#### WASHINGTON, D.C.

##### BURROUGHS

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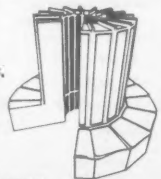
## CRAY RESEARCH, INC.

### Programmer Analyst CRAY 2

We are looking for an individual to join our small software team for the CRAY 2 project. The professional we are seeking will be responsible for developing and maintaining a mathematical library for the CRAY 2. A strong orientation to optimizing code is required. An MA in mathematics is preferred and strong numerical analysis skills and working knowledge of FORTRAN and Assembly languages are essential.

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Working in our IBM 3033/MVS operation, your responsibilities will include design and implementation of COBOL related tasks, systems studies and draft specifications, testing and documenting systems and user training. The selected candidate will be an excellent communicator with 2 years experience in Manufacturing Systems Implementation or systems analysis, COBOL and IMS-DL1. Degree preferred.

### SENIOR PROGRAMMER COBOL/ASSEMBLER

A minimum of 2 years of experience in COBOL/Assembler, CICS, IMS-DL1 data base programming, COBOL package and CICS debugging experience a plus. Responsible for programming and/or package maintenance, designing and preparing test procedures, specifications and time estimates. Excellent communications skills are essential. We are a package shop dealing with IBM COBOL products.

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Tenure track teaching position in computer science or data processing, starting with the Spring 1984 semester (January 16, 1984). Other openings for Fall 1984. Possible Dept. Chairperson appointment. Master's degree in Computer Science and/or teaching experience in the field is desired. Salary and rank dependent on experience. A high level of communication and teaching experience is desired. Teaching assignment in programming languages, systems and procedures, etc. dependent on candidate's knowledge and experience.

Uster County Community College is located in the mid-Hudson Valley, approximately 12 miles from the New York State Thruway, and about 30 miles from New York City. The County is largely rural and residential. The largest industries involve electronics.

Apply in writing to Mr. Frederic K. Manner, Search Chairperson, Uster County Community College, Stone Ridge, New York 12484 or call for application (914) 667-7621, ext. 354.

Uster reserves the right to extend this deadline. Uster County Community College is an EO/Affirmative Action Employer.

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In this position, you will design and develop programming systems for processing management and central data on IBM 3033, 3081 and 3084 systems. In addition, you will analyze customer and project systems requirements and negotiate new or revised programming systems for effective computer processing. You should have a proven track record of progression through Business Systems, Applications Programming, Data Base Design and Analysis, or Data Processing Systems Analysis. Our current

IBM environment includes IBM's 3033, 3081 and 3084 mainframes with IBM's MVS/SP and IBM's VM/SP. Programmer productivity aids include CMS and TSO/SPF. The Business programming language is COBOL. A BS in Computer Science, or Math and six to eight years of experience is desired.

**SOFTWARE ENGINEERS**

We have openings in all aspects for skilled people with a minimum of a BS and 3 or more years experience in scientific data systems.

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Specialists are needed to perform network design, planning, coordination, installation and troubleshooting system with knowledge of network configuration, circuit testing, modern strapping. A BS/CS/EE & 6-8 years of experience desired.

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We are currently seeking professionals with expertise in either operating systems programming using EXEC 1100 internals or IBM Assembler experience with IBM IMS, OS/MVS internals in software systems design and development activities. A BS in Computer Science and 4 or more years experience desired.

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**University Center at  
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The Director is a senior administrative officer with responsibility for computer services for SUNY-Binghamton and a network of other SUNY institutions. Computer services include instructional support, research applications, administrative data processing, a campus-wide word processing network and a regional teleprocessing network.

SUNY-Binghamton is centrally located in one of the heaviest concentrations of high-technology industries in the nation, including IBM, Bendix, General Electric, Singer-Link, Sevin and Universal Instruments. SUNY-Binghamton enrolls over 11,750 students and is one of the four doctoral-granting University Centers of the 64-campus State University of New York. Its academic programs are organized into the School of Arts and Sciences (Harpur College), the Thomas J. Watson School of Engineering, Applied Sciences, and Technology, the Schools of Management, Nursing, General Studies and Professional Education, a Department of Physical Education and Athletics, and the Graduate School. The University also supports seven specialized research centers and (in cooperation with the Upstate Medical Center) a Clinical Campus. Research and teaching are supported by libraries holding over 1,000,000 volumes and extensive microform and journals collections.

The main computer facility consists of a NAS Advanced System 6 with processor assist and 6 million bytes of main storage. The system currently supports 350 on-line interactive terminals and 14 remote job entry locations. In addition, the campus has recently purchased a DEC VAX 11/750 with 6 million bytes of memory storage for academic computing purposes. The institution is also installing a campus-wide word processing network utilizing DECmate II work stations and a VAX 11/750.

The Director must have demonstrated managerial capability, planning and budgeting expertise, a thorough knowledge of hardware and software applications, and a strong commitment to user service. Experience in a complex, highly integrated computing environment is essential. Effective writing skills and the ability to explain technical issues to non-technical audiences are essential. A PhD degree in an appropriate field is highly desirable. Salary is highly competitive with an exceptionally attractive benefit package.

The Search Committee will begin formal screening on October 31, 1983 and will continue until a suitable candidate is found. Applications and nominations should be sent to Mr. Dean E. Hyde, Chair, Search Committee for Computer Center Director, SUNY-Binghamton, Binghamton, New York 13901. Applications should consist of a Letter of Interest, Resume, and at least three Letters of Recommendation. References should send Letters of Recommendation directly to the Chair.

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Applications are invited for tenure-track faculty positions in Computer Science to begin in January or August, 1984. A Ph.D. in Computer Science (any area) is preferred. A M.S. with potential for Ph.D. will be considered. Responsibilities include developing curriculums, teaching at the graduate and undergraduate levels, as well as conducting research. Salary and rank are negotiable. Send letter of application, resume, complete transcripts and three letters of reference to Dr. George Mead, Head, Department of Mathematical Sciences, McNeese State University, Lake Charles, LA 70608. Phone: (518) 477-2520, X425.

**SYSTEMS ANALYST**-Design, anal., impl. computer systems. Maint./Enhance systems & provide vital skills to ensure successful & cost effective operation. 3 yrs exp. or 3 yrs in programming. Bach. in CompSci., Math. or Physics. Knowl. of COBOL, CICS, PL/1, & IMS DB/DC. \$33,000 p.a. 40 hrs/5 days/wk. SEND RESUMES to MGI, 6808 Adams St., Guttenberg, NJ 07093.

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You will assist with design review, design coordination and product planning. Other responsibilities include current/future product research and consulting to the Marketing Department.

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Will manage effort to build test cases and stress test all Candle software products prior to shipment. Also responsible for ensuring user friendliness of Candle products, good documentation and ease of installation. Systems programming background as well as quality assurance experience in large scale environments desired.

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**SENIOR SYSTEMS PROGRAMMER:** Development, maintenance, testing of SNA and other network projects. 3-4 years in systems programming. BS in Computer Science. Knowledge of SNA protocol and packet switching networks.

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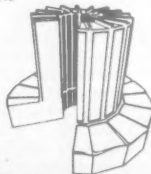
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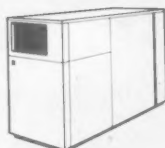
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
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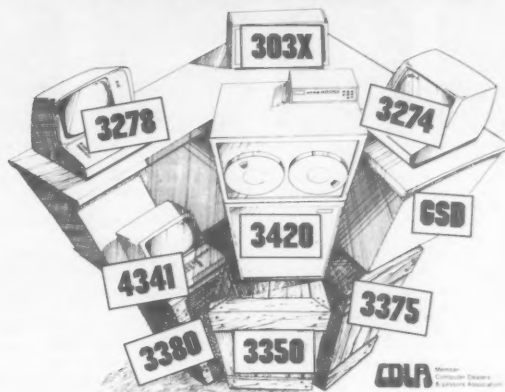
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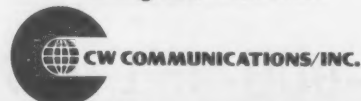
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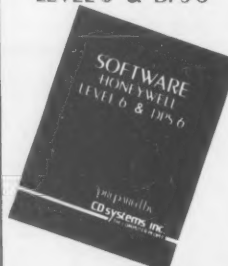
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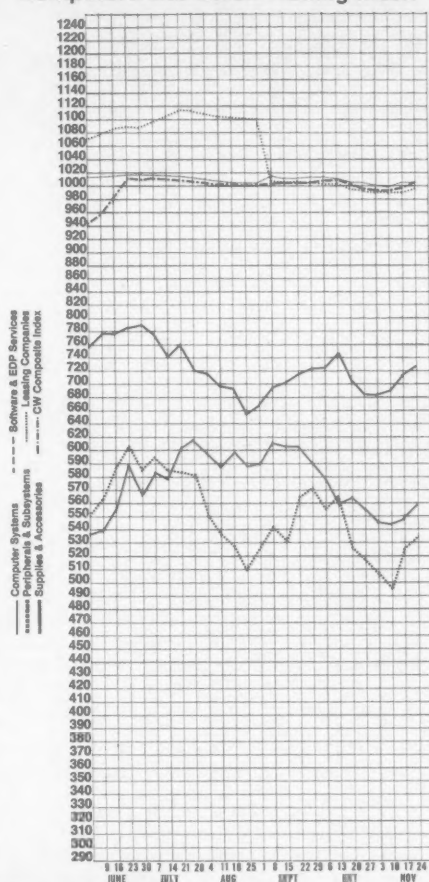
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## ADVERTISERS INDEX

ACX.....	ID/4	DMC/Datatel Minicomputer Co.....	24	NCR Corp.....	137
Adminet.....	ID/8	Dorlen.....	SR/16	Netec.....	93
Amahl.....	77	Dynalac.....	39	New Trend Group.....	62
American Key.....	100	Dysan.....	34,146	Nixdorf Computer Corp.....	134
Anixter Bros, Inc.....	120	Eastman Kodak.....	4	Northern Telecom.....	58-59,122-123
Apollo Computer.....	74-75	Electronic Protection Devices.....	SR/14	NYU.....	120
Applied Computer Research.....	10	Envision.....	138-139		
Applied Data Communications.....	ID/42	EPS Inc.....	SR/10		
Artificial Intelligence.....	9	Execucum.....	111		
Ashlon-Tale.....	92,130	Exxon Office Systems.....	121		
ASK.....	ID/18				
A.S.T. Research.....	28	Facit, Inc.....	ID/16		
AT&T Info Systems.....	ID/34-ID/35	Feeley & Driscoll, P.C.....	SR/29		
Auerbach Publisher.....	45	Fibronics.....	ID/36		
Automated Trainings Systems.....	SR/27	Fischer Innes.....	SR/19,SR/21,SR/23		
		Forte Data Systems.....	41		
BASF.....	85	Four Phase Systems.....	ID/47		
John Beall Company.....	135	Fox Research.....	ID/10		
Bell & Howell Service.....	126	Fusion Products.....	27		
BGS.....	37				
BMC Software.....	25	Gavilan.....	48		
Boole And Babbage Inc.....	61	General Datacom.....	36,131		
Boscom.....	ID/78	General Electric.....	29		
M. Bryce & Associates.....	ID/17	General Research Corp.....	ID/37		
Bystron.....	42	Graham Magnetics.....	ID/39		
		H & W Computer Systems.....	11		
Cambridge Systems.....	SR/28-SR/29	Hambrecht & Quist.....	80,141		
CCA.....	SR/24	Hitachi.....	108		
C. Hoh.....	64	Honeywell Info Systems.....	32-33, ID/40-ID/41,118-119		
Cecom, Inc.....	ID/36	Hyperion.....	62-63		
Cincom.....	ID/25-ID/32	IBM.....	16,51		
Cipher Data.....	20-21	IBM/ISG.....	91		
CMI Corp.....	72	IDAPS.....	34		
Cognel.....	44	IE Systems Inc.....	73		
Comedesign.....	79	Infodata.....	23		
Comdisco.....	SR/4-SR/5	Inform Computer Terminals.....	132		
Communications Sciences.....	14	Infotron.....	66-67		
Comnet '84.....	103	Innovation Data Processing.....	ID/48		
Comnet.....	ID/48	Interactive Training Systems.....	127		
Compaq.....	ID/6-ID/7	IPF Publications.....	SR/28		
Computer Associates.....	SR/22	Jaehne Associates.....	106		
Computer Automation.....	60	Keytronics.....	140		
Computer Information Systems.....	ID/37	Knoware.....	SR/25		
Computer Parts Exchange.....	68	KW Controls.....	123		
Computer Technology Group.....	12	J.W. Lampi.....	SR/12-SR/13		
Computware.....	80	LearnSleight.....	SR/10		
Continental Resources.....	64	LeeMAI.....	SR/11		
Control Concepts.....	56	Liebert Corporation.....	10,80		
Control Data Corp.....	88,102/38	Local Data.....	50		
Corodale.....	95	3M.....	ID/46		
Corona Data Systems.....	91	Manager Software Products.....	46-47		
Corus.....	143	Martin Marietta.....	49		
CPI.....	28	Maxell Computers.....	ID/1		
Cullinet.....	89	MCBA.....	SR/17		
CW Buyer's Guide.....	SR/26	Media Container.....	124		
CW International.....	102,SR/15,136	Memorex CTD.....	113		
CW On Communications.....	SR/32	Metaphase Inc.....	24		
CW Supplement.....	SR/31	MicroAge.....	57		
CXI.....	100-101	Microdata.....	94		
		Micro Focus.....	ID/24		
DASD.....	141	Microtempus.....	98-99,180		
Datalif Assoc.....	SR/16	Mitron Systems Corp.....	13,15,17		
Datamation.....	50	MSA.....	40		
Dataproducts.....	129	MTI Systems Corp.....	62		
Data Storage Solution, Inc.....	22	Multi Solutions.....			
Davon Communications Corp.....	ID/44-ID/45,142				
Deltak.....	112				
Deltak, Inc.....	136				
Digital Consulting Associates.....	SR/9				
Digital Research.....	114-115				

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CLOSING PRICES TUESDAY, NOVEMBER 22, 1983										Cambridge, Mass. 02139										
E X C H	1982-83 RANGE (1)	CLOSING NOV 22 (1)	PRICE CHG (1)	MEEK CHG (1)	MEEK CHG (1)	PCT CHG (1)	E X C H	1982-83 RANGE (1)	CLOSING NOV 22 (1)	PRICE CHG (1)	MEEK CHG (1)	MEEK CHG (1)	PCT CHG (1)	E X C H	1982-83 RANGE (1)	CLOSING NOV 22 (1)	PRICE CHG (1)	MEEK CHG (1)	MEEK CHG (1)	PCT CHG (1)
COMPUTER SYSTEMS																				
D	ALPHA MICROSYSTEMS	11-24	14	-3/4	-5.0		D	ADVANCED CORP TECH	1-8	3	0	0.0		D	COMPUTER DEVICES INC	1-21	7/8	-1/4	-22.2	
D	ALTOS COMPUTER SYST	8-28	8 7/8	+1/8	+1.4		D	ADVANCED SYSTEMS INC	6-22	17 3/4	+3/4	+4.4		D	COMPUTER TRANSCIVER	4-12	4 7/8	0	0.0	
A	ARADIAN CORP	9-30	19 5/8	-1/8	-0.8		D	ASIS COMPUTER INC	7-32	27	+1/4	+4.8		N	CONRAD CORPORATION	19-53	46 1/8	+3 1/4	+7.5	
D	APPLE COMPUTER INC	18-63	21 1/2	+1/2	+7.5		N	AMERICAN SOFTWARE INC	28-31	21 3/4	+1/4	+1.8		N	CONRAD CORP	17-38	17 3/8	+5/8	+3.7	
N	ATAT	60-70	64 1/2	+1/8	+2.1		N	ANACORP INC	8-23	8 1/8	+1/4	+1.8		A	DATAPRODUCTS CORP	16-41	29 1/8	+1/4	+0.8	
N	BURGESS CORP	28-58	48 3/4	+5/8	+1.2		D	ANALYSTS INT'L CORP	9-25	13 1/2	-2 1/4	-14.2		A	DATARAC CORP	5-12	10 1/8	-1/8	-6.9	
D	COMPUTER AUTOMATION	8-17	6 1/2	-1/4	-3.7		N	APPLIED DATA RES.	31-42	31 1/2	+3/4	+3.1		D	DATA SWITCH CORP	13-41	32 1/2	+2	+10.1	
A	COMPUTER CONSOLES	8-26	20 5/8	+1	+5.0		D	ASK COMPUTER SYSTEMS	8-20	18 3/4	+1 1/4	+7.1		D	DATUM INC	2-17	9 1/4	-3/4	-7.5	
N	CONTROL DATA CORP	21-62	44 1/8	-1 3/4	-3.8		N	ASTRADYNE CORP	5-17	5 1/4	0	0.0		D	DECISION DATA CORP	3-18	11 1/2	-1/4	-2.1	
N	CONVERGENT TECHNOLOG	18-41	24	+5/8	+2.8		N	ATOMIC DATA PROC	21-44	25	+3/8	+1.0		D	DELUCCI-OLIVETTI	11-38	13 3/8	+7/8	+7.0	
N	CRAY RESEARCH INC	20-38	56 1/4	+2 5/8	+6.8		D	COMPUTER ASSOC	8-17	23 3/4	+1	+4.3		D	ELECTRONIC M & H	5-11	5/8	+1/2	+7.9	
D	DATA GENERAL CORP	10-41	37 1/4	+7/8	+2.4		D	COMPUTER ASSOC INT'L	5-17	24	+1/2	+5.8		B	EVANS & SUTHERLAND	18-30	24 3/4	-1/4	-2.7	
N	DATAPoint CORP	11-38	27 1/4	-3/4	-2.8		D	COMPUTER HORIZONS	8-20	12 1/4	+1/4	+2.0		D	GANDALF TECHNOLOGIES	12-13	12 3/4	+1/4	+1.8	
N	DELOITTE EQUIPMENT	8-16	14	-1/8	-0.8		D	COMPUTER NETWORK	4-10	6 1/2	+1/2	+6.3		D	GEN'L DATA CORP	6-28	28 1/2	+1/4	+3.8	
N	ELECTRONIC ASSOC.	5-15	6 3/4	0	0.0		N	COMPUTER SCIENCES	11-23	12 1/4	+3/4	+4.3		D	GREAT SOUTHWEST INC	1-6	0	0	0.0	
N	FLORIAN POINT SYST	22-47	35 3/8	+1 5/8	+4.8		D	COMPUTER TASK GROUP	8-22	15 1/4	+3/4	+5.1		N	HAZELTINE CORP	7-31	25 3/8	+1 1/2	+6.2	
N	FORBES CORP	3-16	11 1/8	-3/8	-3.2		D	COMPUTER USAGE	2-22	14 1/4	+3/4	+5.3		D	ICD CORP	3-10	4 1/4	+1/4	+6.2	
D	GENERAL AUTOMATION	28-44	32 3/8	+1 7/8	+6.1		D	COMPUTONE SYSTEMS	5-38	8 1/8	-3/8	-5.7		O	INFORMATION INT'L INC	10-22	13 3/4	+3/4	+5.1	
N	GULD INC	26-44	32 3/8	+1 7/8	+6.1		N	CONSERV CORP	5-20	5 1/8	-2/8	-3.0		D	INTEL CORP	11-45	42 3/4	+1	+2.3	
							D	CONSHARE	7-13	10 3/4	-1/8	-1.1								
N	HARRIS CORP	20-51	38 7/8	+7/8	+2.3		N	CULLINET SOFTWARE	12-50	43 3/8	+1 7/8	+4.5		D	IPL SYSTEMS INC	5-14	6 1/2	+3/4	+13.9	
N	HILLIETT-PACKARD CO	22-48	40 3/4	+1 1/8	+2.8		D	CYBARE SYSTEMS INC	8-27	17 1/2	0	0.0		A	LUNDY ELECTRONICS	7-18	12 3/4	+1/2	+5.1	
N	IBM	57-134	123	-1 3/4	-1.4		N	DATA SWITCHING SYST	10-42	39 1/2	0	0.0		D	MEGADATA CORP	9-15	12 1/2	+1	+6.6	
D	IFLA-CORP INC	5-14	6 1/2	+3/4	+13.0		D	HOGAN SYSTEM INC	27-33	28	-1/4	-0.8		A	MSI DATA CORP	16-37	20 5/8	+5/8	+2.9	
D	MAGNUSON CORP SYST	2-5	3/8	0	0.0		N	GENERAL ELECTRIC CO	45-58	58	+7/8	+1.5		N	NASHUA CORP	8-28	25 1/2	+1/4	+4.0	
N	MANAGEMENT ASST	7-18	17 1/2	+1/8	+0.7		N	GENERAL ELECTRIC CO	45-58	58	+7/8	+1.5		D	NETWORK SYSTEMS CORP	8-34	23 3/4	+1/4	+1.0	
N	MATSHITA ELECTRIC	47-77	75 3/4	+1 1/8	+1.5		N	INFORMATICS INC	10-34	28	+2 3/4	+11.8		N	NO AMERICAN PHILIPS	47-78	76	-7/8	-1.1	
N	MODULAR COMPUTER SYS	8-18	7 7/8	-1/8	-1.5		N	INFUSION SYSTEMS CORP	4-10	6 3/4	-3/4	-2.2		D	NORTHERN TELECOM LTD	22-48	45 1/4	+3	+7.1	
N	MODULAR DATA SCI	10-18	13 3/4	0	0.0		D	KEANE ASSOCIATES	4-15	7 1/4	0	0.0		D	OREX	3-8	3 3/4	0	0.0	
N	MOTOROLA INC	82-148	139 3/4	+1 1/8	+0.7		A	LEONICO	8-31	30 3/4	+1 3/4	+6.0		N	PARADYNE CORP	14-30	18 1/4	-3/8	-2.2	
N	NAT'L SEMICONDUCTOR	22-60	51 1/2	-1/4	-0.4		A	LOGIC COMMUNICATIONS	7-17	18 3/4	+1 3/4	+6.0		D	PERMIL CORP	7-17	12 1/4	+1/4	+2.1	
N	NCR	38-138	135 1/2	+2 3/4	+2.0		D	LOGIC SCI AMER INC	8-33	32	0	0.0		N	PLESSEY CO (ADM)	26-41	30	-2 1/2	-7.5	
N	PERKIN-ELMER	17-37	23 7/8	+5/8	+2.1		D	LOGIC SCIENTIFIC APP	8-33	32	0	0.0		D	PRINTRONIX INC	23-34	29	-1/4	-0.8	
N	PRIME COMPUTER INC	11-30	18 3/8	+3/4	+11.9		D	MONIN-INSEER CORP	8-22	16 1/4	-1/4	-2.3		D	RANTER CORP	8-28	11 3/4	-1/4	-2.0	
N	SENTRY CORP	21-47	48 3/4	+1 1/2	+3.1		D	NATIONAL DATA CORP	5-28	15 3/8	-3/4	-5.0		N	RAYTHEON CO	42-58	45 1/4	+3/8	+0.8	
D	TANDEN COMPUTERS INC	14-40	37 3/4	+5/8	+10.8		D	ON-LINE SOFTWARE INT	17-27	18 1/2	-1/2	-2.5		N	RECONITION EQUIP	4-17	13 1/2	-1/8	-10.7	
N	TANDY CORP	34-65	37 3/8	+7/8	+2.2		D	PANFOLP SYSTEMS INC	8-30	20 3/8	+3/8	+2.8		N	ROLP CORP	40-49	46 1/8	+1/8	+5.8	
D	TELEVIDEO SYSTEMS	14-41	20	+2 5/8	+15.1		D	PLANNING RESEARCH	6-17	6 1/8	+1/8	+1.7		N	SANDERS ASSOCIATES	52-120	53 5/8	-1 5/8	-2.8	
							D	POLICY MGMT SYST CP	15-35	31 1/4	+3/4	+2.4		D	SCAN DATA	1-3	5/8	0	0.0	
N	TEXAS INSTRUMENTS	71-178	133 1/4	-3 3/4	-2.7		D	SCAN-TRON CORP	12-18	14 3/4	+1	+7.2		N	SCIENTIFIC ATLANTA	15-33	15 3/8	+3/4	+5.1	
N	VECTOR GRAPHICS INC	2-14	2 3/8	0	0.0		O	PROGRAMMING & SYS	1-8	5 5/8	-1/8	-2.2		N	STORAGE TECHNOLOGY	42-58	45 1/4	+3/8	+0.8	
A	VANG LABS "B"	13-42	34 3/8	0	0.0		D	REYNOLDS & REYNOLD	17-33	48 3/4	+1 1/2	+3.1		D	SVKES DATATECHNICS	5-27	4 7/8	0	0.0	
A	VANG LABS "C"	11-42	34 3/8	-1/8	-0.3		D	REYNOLDS & REYNOLD	17-33	48 3/4	+1 1/2	+3.1		N	SYSTEMS & COM TECH	26-39	29 1/2	+1/4	+4.4	
N	XEROX CORP	35-50	47 5/8	+1 1/8	+2.4		D	SHARED MEDICAL SYST	13-43	36	-1/2	-1.2		A	T BAR INC	7-17	10 3/8	+1/4	+13.6	
							D	SHARED MEDICAL SYST	13-43	36	-1/2	-1.2		A	TAB PRODUCTS CO	8-30	22 1/8	+1/8	+7.7	
							D	SHARED MEDICAL SYST	13-43	36	-1/2	-1.2		D	TANDON CORP	18-35	22 3/4	-1/4	-1.0	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		A	TEC INC	12-18	8 3/4	0	0.0	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		N	TERNITRON INC	34-87	80 1/8	-3/8	-0.4	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		N	TEXEL	5-32	24 7/8	0	0.0	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		D	TESDATA SYSTEMS CP	2-17	10 3/4	-1/8	-1.1	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		N	TETRALEX INC	7-29	26 1/8	+2 1/8	+8.8	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4		O	VISUAL TECHNOLOGY	9-28	18 3/4	+1	+5.6	
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4								
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4								
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							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4								
							D	SOFTWARE AG	5-17	15 1/2	+1/4	+2.4								
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EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;  
 L=LOS ANGELES; H=HONOLULU; O=OVERSEAS; S=SEATTLE;  
 D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID  
 (1) TO NEAREST DOLLAR



# 15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who's worth his salt should be able to answer them without backpedaling.

## Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is the software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

## Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest \$25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That

eliminates a lot of tedious work you normally have to do.)

## Save this box. It can help you make an intelligent software decision.

**1. Can you offer us a complete range of software systems designed to work together?**  
Or will we have to piece together a patchwork of systems?

**2. Are your systems just record keepers, or can they really help us make decisions?**  
Can we pull together information from any of our integrated systems? In exactly the form we want it?

**3. Can you provide business software for both mainframe and microcomputers?**  
Do you develop this software yourself or do you simply market it for another company?

**4. Are your systems truly online?**  
How many of our information is current?  
How many of your systems are online? How secure are they?

**5. Will my company have to be the one that discovers the bugs in your brand new system?**  
Just how long have your systems actually been used, and how have they been tested?

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## 35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

## The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data process-

**6. Will you update your systems as technology advances and regulations change?**  
What are some of your most recent updates? Will you keep us current on regulatory changes?

**7. Do your systems really do everything you say they will?**  
Or will we have to change them or add to them to get the features we want?

**8. How long have you been in business?**  
What are your revenues? What is your growth record? Where will your company be five years from now?

**9. How many systems has your company installed?**  
How many of these were installed in the past six months? How many of your earlier customers are still using—and liking—your systems?

**10. Do your financial systems handle unlimited foreign currencies?**  
Do your financial systems use a common set of currency exchange rates?

ing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

## MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with

**11. Can you link our executives' computers directly to the mainframe—so they can get their own information?**  
Is that software available right now?

**12. How will you make sure our own people thoroughly understand your system?**  
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

**13. How many of your people specialize in software for my industry?**  
How many accountants work for you? Human resource specialists? Manufacturing experts?

**14. Do your systems have built-in features that make them easier to use?**  
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

**15. As my business changes, will your system be flexible enough to change with it?**  
Or will we have to pay a lot to revamp it? Or even regenerate it?

MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

## Talk to us

We'd like to send you more information on how MSA can help you plan for software. And on individual systems. Contact Robert Carpenter at (404) 239-2000.

## FREE personal computer...



...with your qualifying purchase of MSA mainframe software and Executive Peachpak II™ the hot new technology that links your personal computers to the mainframe. So executives can get their own information without waiting for print-outs from data processing.

You'll be getting the highest quality mainframe software available. Executive Peachpak II, the advanced micro software that links PCs to the mainframe. And a free personal computer as a bonus.

This special offer is available for a limited time only. For details on how to get your free personal computer, contact Robert Carpenter today at (404) 239-2000. Or write "Free Computer Offer," Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

This offer expires December 31, 1983, so act today.

## MSA ready-to-install application software

1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
4. Fixed Assets Accounting
5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Order Processing
9. Foreign Exchange
10. Inventory & Purchasing
11. Payroll
12. Personnel Management & Reporting
13. ALLTAX™ Taxing System
14. Manufacturing Control System (MRP II)
15. Executive Peachpak™ II
16. Peachtree Software™ business systems for microcomputers
17. Peachtree Software™ office productivity systems for microcomputers

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# MSA

The Software Company



